

# **SECTION 3.0**

## **STREAMFLOW**

## **3.0 STREAMFLOW**

### **3.1 Overview**

PFRD operates and maintains eighteen (18) streamgaging and two (2) tidal stations in Orange County. Each station is equipped with a continuous water-stage recorder and ALERT transmitter/data logger and water level sensor. The ALERT water level sensor provides the ability to monitor the stage at each station in real time. The water level sensor identifies a change in stage sending a signal to the ALERT transmitter which transmits the station identification and a water level value to the base station computer located at the PFRD Katella Facility. The ALERT water level data is stored on a server and is available as a backup to the water stage recorder charts.

Mean daily and total annual discharges are computed from station water stage recorder charts and ALERT data. The Western Hydrologic Data Reduction System is used to assist in computation. Automatic computation of surface water records is performed by electronically converting gage heights to discharges from channel ratings. Annual discharge data associated with each station are stored on a server.

### **3.2 2001-2002 Data Presentation**

**Figure 10** shows the location of the PFRD streamgaging and tidal stations. Streamflow summaries are presented in **Table 25** and include peak discharge, minimum and maximum discharges, and total runoff volume. Daily discharge summaries for the stations are presented in **Tables 27 through 41**. Location maps and specifics for each station are presented in **Figures 12 through 26**.

Historical discharge summaries for each of the gaging stations are listed in **Appendix A**.

The USGS has several streamgaging stations in or affecting Orange County. Provisional discharge data for the eight USGS stations are provided in **Tables 42 through 49**. Bonita Canyon and Sand Canyon are a component of the sediment TMDL program with the operation and maintenance of the station cost shared among the program participants.

Listed in **Table 26** is the drainage area, period of record and momentary peak discharge for each respective station. Station locations of the USGS gaging stations are shown in **Figure 11**. Complete data for the USGS stations are published in the report entitled “Water Resources Data for California (Part 1).”

The maximum peak discharge for all runoff stations was 2,780 cfs, which was recorded on November 24, 2001 at the Oso Creek at Crown Valley Parkway station.

Discharge records are not included for Lower Oso Creek, Lower Aliso Creek, Lower East GardenGrove -Wintersburg and Laguna Beach Channel. The stage-discharge relationship for Lower Oso and Lower Aliso Creek are presently being defined. The Lower East GardenGrove - Wintersburg station was discontinued because channel improvements resulted in extreme tidal influence and a station rating could not be defined. Laguna Beach Channel was undergoing gage house replacement and equipment upgrades.

Table 25

## **DISCHARGE SUMMARY**

### PFRD STREAMGAGING STATIONS

(2001-2002)

OCPFRD NO.	STATION NAME	MOMENTARY PEAK		MAX DAY IN CFS	MIN DAY IN CFS	MEAN DAILY IN CFS	TOTAL AC-FT
		CFS	DATE				
2	Fullerton Creek at Richman	2,000	24-Nov-01	129	0.14	2.51	1,820
4	Aliso Creek near Jeronimo	254	24-Nov-01	25	0.36	1.60	1,164
152	Alameda Storm Channel at Hewes	45	21-Dec-01	1.8	0.00	0.12	87
207	Westminster Channel at Hazard	270	24-Nov-01	22	0.08	0.71	516
214	Santiago Creek at Villa Park Dam	20	13-Sep-01	4.2	0.03	0.24	173
216	EI Modena - Irvine at Michelle	732	28-Jan-02	41	0.78	2.00	1,450
218	Oso Creek at Crown Valley Pkwy	2,780	24-Nov-01	321	1.20	4.42	3,200
220	Santa Ana Delhi at Irvine Ave.	594	24-Nov-01	69	1.10	5.63	4,081
225	Bolsa Chica at Westminster	1,440	24-Nov-01	173	0.31	2.75	1,990
226	San Diego Creek at Campus Dr.	1,760	24-Nov-01	314	3.90	14.70	10,610
230	Peters Canyon Wash at Barranca	1,390	28-Jan-02	126	4.10	8.02	5,803
231	San Diego Creek at Culver	880	12-Nov-01	130	0.58	3.63	2,630
232	Anaheim Barber City at Rancho Rd	1,820	24-Nov-01	208	0.32	2.80	2,030
287	Oceanview Ch.at Stonecress Park	225	24-Nov-01	15	0.00	0.43	317
1187	Upper EGG-Wintersburg at Allard	146	24-Nov-01	5.1	0.00	0.09	65

Table 26

## USGS DISCHARGE SUMMARY

### STATIONS IN OR AFFECTING ORANGE COUNTY

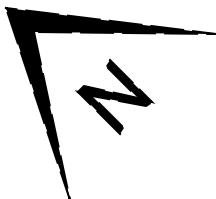
STATION NUMBER AND NAME		DRAINAGE AREA SQ-MI	PERIOD OF RECORD FROM      TO		MOMENTARY PEAK (For Period of Record)	
					CFS	DATE
11047300	Arroyo Trabuco at Del Obispo	54.1	1995	Present	10,000	23-Feb-98
11088500	Brea Creek Below Brea Dam	21.6	1942	Present	1,700	18-Feb-80
11075720	Carbon Creek Below Carbon Dam	19.5	1961	Present	796	01-Mar-83
11089500	Fullerton Creek Below Fullerton Dam	4.9	1941	Present	392	01-Mar-83
11046530	San Juan Creek at La Novia St.	109.0	1985	Present	25,600 E	05-Mar-95
11074000	Santa Ana River Below Prado Dam *	1,490.3	1940	Present	7,440	21-Feb-80
11078000	Santa Ana River at 5th St.	1,770.0	1923	Present	46,300	03-Mar-38
11075800	Santiago Creek at Modjeska	12.5	1961	Present	6,520	25-Feb-69
11077500	Santiago Creek at Bristol	98.5	1928	Present	6,600	25-Feb-69
11048553	Sand Canyon Creek at Irvine CA	7.1	2001	Present	N/A	N/A
11048600	Bonita Creek at Irvine CA	5.4	2001	Present	N/A	N/A

\* Excludes 768 Sq. Mi. above Lake Elsinore.

E = Estimated Discharge

# PUBLIC FACILITIES AND RESOURCES DEPARTMENT

## STREAMGAGING STATIONS / TIDE STATIONS



Los Angeles Co.

San Bernardino Co.

Riverside Co.

### STREAMGAGING STATIONS

- 2 Fullerton Creek (A03) at Richman
- 4 Aliso Creek (J01) at Jeronimo
- 152 Alameda Storm Drain (E08602) at Hawea
- 207 Westminister Channel (C04) at Hazard
- 214 Santiago Creek (E18) at Villa Park Dam
- 218 El Modena Irrine (F07) at Michelle
- 218 Oso Creek (L03) at Goyan Valley Hwy.
- 220 Santa Ana - Delhi Channel (F01) at Irvin Ave.
- 222 Laguna Canyon Channel (D02) at Woodland
- 225 Boise Chica Channel (C02) at Westminster Blvd.
- 228 San Diego Creek (F05) at Campus Drive
- 230 Palos Canyon Wash (F16) at Bermano Pkwy.
- 231 San Diego Creek (F15) at Culver Driv.
- 232 Anaheim - Buena City (C03) at Rancho Rd.
- 287 Orangeview Channel (C08) at Stoneridge Park
- 300 Lower Oso Creek (L03) at upstream Chisen Bridge
- 1187 Upper East Garden Grove Wintersburg (C15) at Allard Ave.
- 1146 Lower Aliso Creek (J01) at Treatment Plant

### TIDE STATIONS

- 254 Brookhurst Tide Stations (D02) at Brookhurst St.
- 258 Magnolia Tide Stations (D01) at Magnolia St.

PACIFIC OCEAN

San Diego Co.

Figure 11

## USGS STREAMGAGING STATIONS

### LOCATION MAP

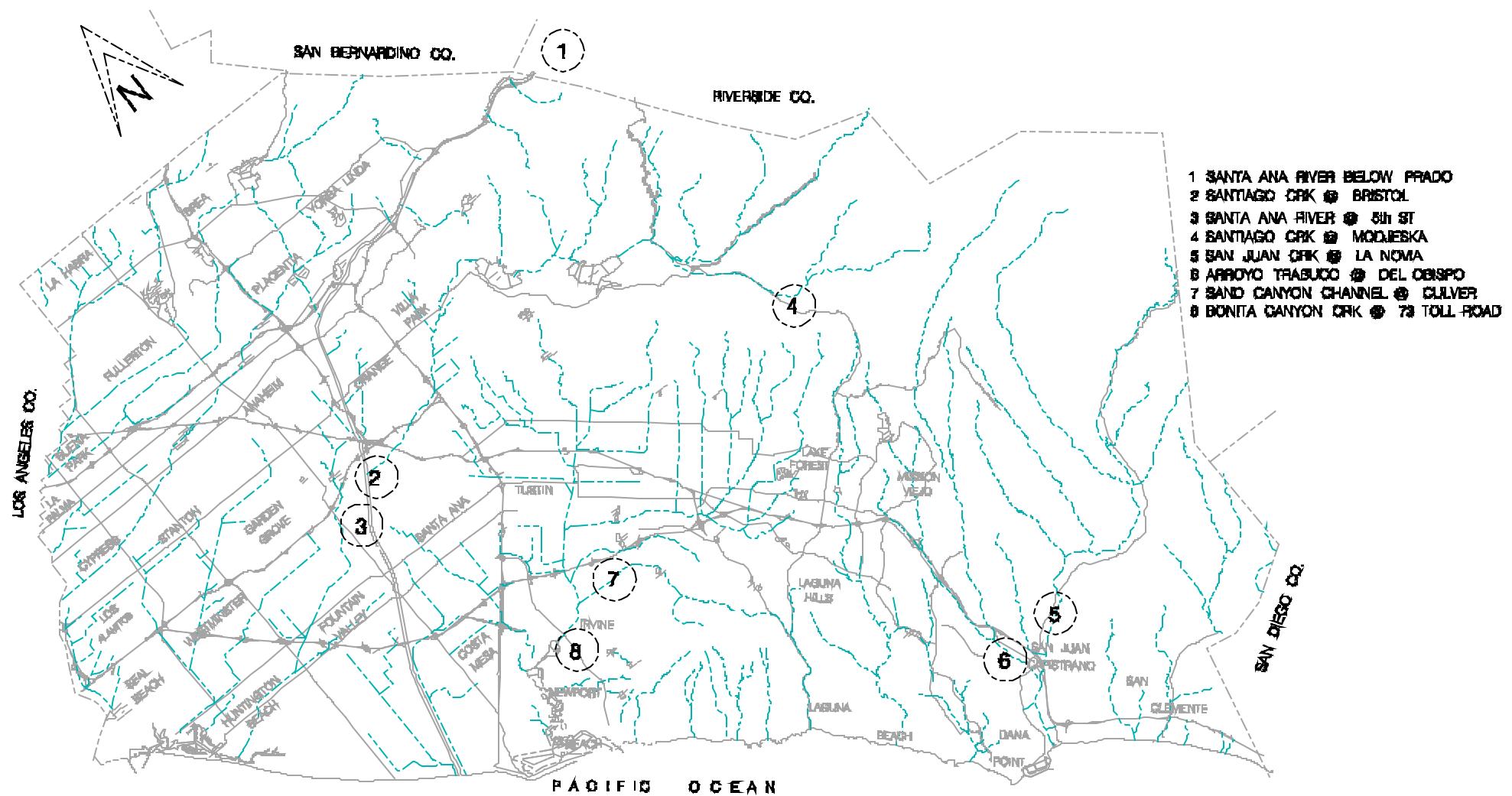
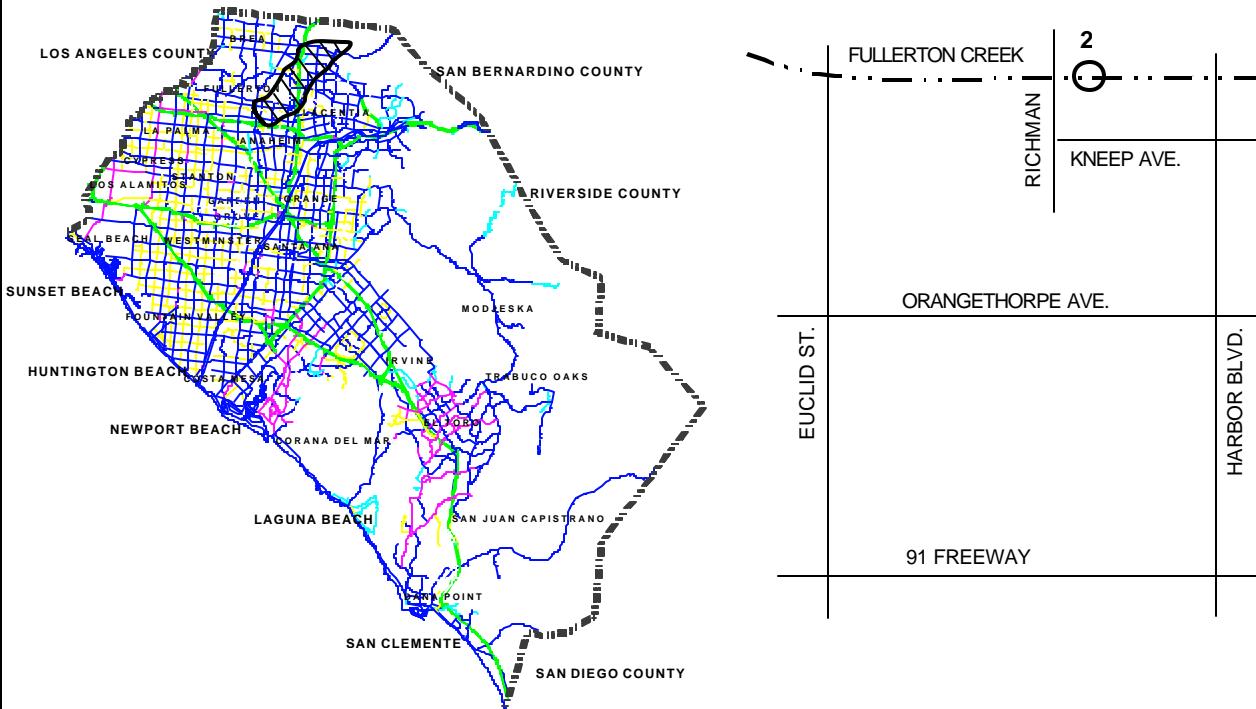


Figure 12

## FULLERTON CREEK AT RICHMAN STATION NO. 2



<b>LOCATION:</b>	Latitude $33^{\circ} 51' 47''$ , Longitude $117^{\circ} 55' 55''$ . On the right bank approximately 125 ft. east of Richman Ave. and 180 ft. north of Knepp Ave.
<b>DRAINAGE AREA:</b>	12.1 sq. Mi ( $31.3 \text{ km}^2$ ) including 7.0 sq. mi. ( $18.1 \text{ km}^2$ ) above Fullerton Dam.
<b>GAGE ELEVATION:</b>	126.4 ft. (38.5 m) MSL.
<b>HYDRAULIC CONTROL:</b>	Supercritical flow - concrete lined, trapezoidal channel.
<b>EQUIPMENT:</b>	Stevens A-71 water-stage recorder with float, ALERT rain gage and USCOE water level equipment.
<b>PERIOD OF RECORD:</b>	November 1959 to present.
<b>REMARKS:</b>	Flow regulated by Fullerton Flood Control Reservoir since October 1941.
<b>RATING CURVE ACCURACY:</b>	Good

Table 27

**FULLERTON CREEK AT RICHMAN**

Station 2

Public Facilities and Resources Department

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

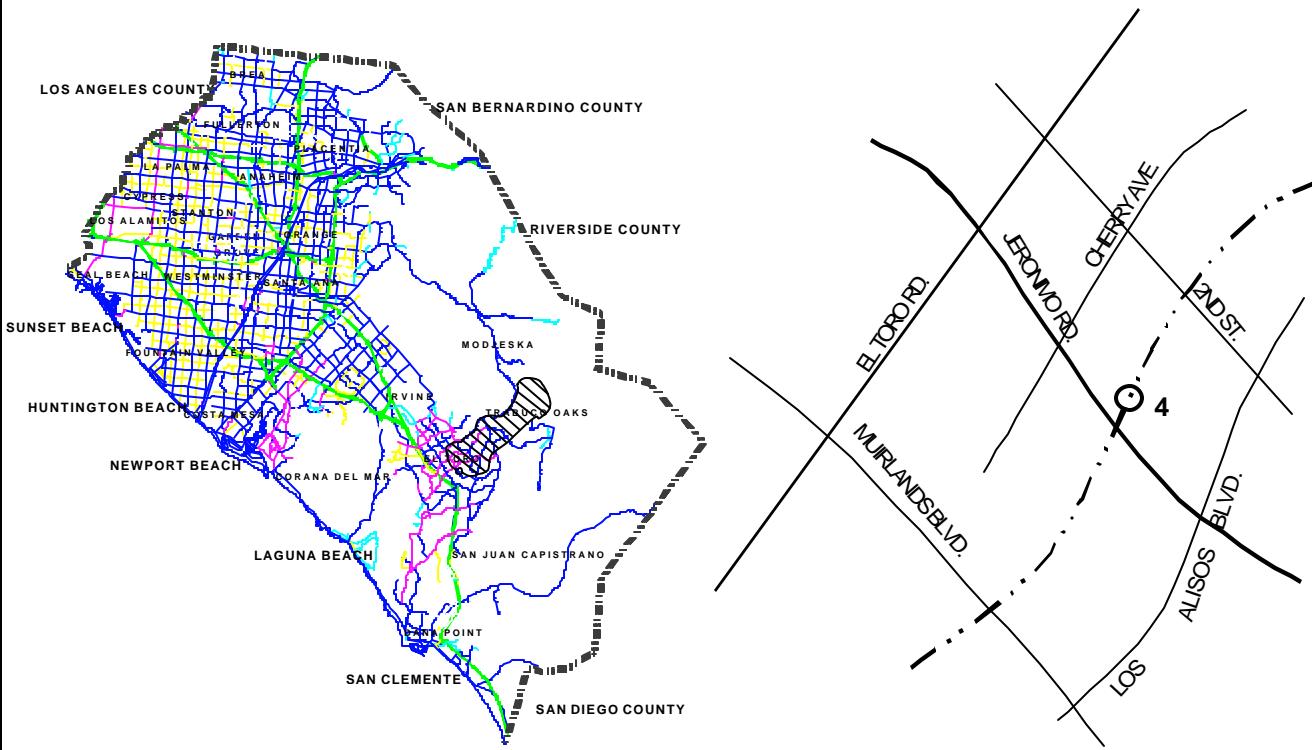
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.75	.39	1.1	1.2	.42	.45	.74	.71	.90	4.1	.96	1.3
2	.66	.46	1.4	.97	.44	.51	1.1	.96	.76	4.5	1.2	1.3
3	.75	.69	1.2	.85	.64	14	1.9	.71	1.3	5.6	1.2	1.2
4	.58	.62	.95	.84	.68	.65	.60	.76	1.4	5.0	1.2	1.9
5	.85	.56	.76	.67	.95	.36	.58	.85	1.4	8.7	1.2	2.3
6	.89	.66	.96	.64	.99	.32	.52	.75	1.2	9.6	1.3	2.3
7	.88	.63	1.0	.76	.97	.32	.63	.93	9.8	4.6	1.4	2.9
8	.70	.66	.94	.62	.71	.29	1.1	1.0	2.6	12	1.5	3.1
9	.52	.77	.97	.90	.76	.36	.64	.95	1.1	13	1.6	3.3
10	.60	1.1	1.0	1.1	.82	.33	.87	.61	.97	12	1.6	3.3
11	.76	1.1	.92	1.0	.82	.34	.68	.39	1.0	4.0	1.8	4.1
12	.59	1.1	.89	1.1	31	.35	.63	.55	1.2	4.9	1.6	4.3
13	.72	1.1	.86	1.0	13	.32	.60	.52	1.3	4.3	1.6	4.6
14	.68	.99	.95	.96	.55	16	.66	.40	1.2	4.5	2.2	4.8
15	.64	.73	.95	1.1	.40	1.7	.60	.50	1.5	12	2.2	5.4
16	.89	.76	1.0	1.1	.42	.46	.71	.51	1.7	3.3	2.8	4.8
17	.77	1.0	1.0	.90	.37	.39	.70	11	3.5	3.2	3.1	3.8
18	.58	1.1	.91	.58	.26	.43	.66	1.1	6.6	3.1	3.7	4.6
19	.64	1.1	1.0	.63	.29	.44	.62	.80	1.9	3.7	3.8	4.1
20	.71	1.0	.92	.73	.39	.51	.58	.70	1.8	3.5	24	3.6
21	.75	1.1	.84	.66	.35	53	.55	.60	2.1	3.2	1.2	2.9
22	.51	1.2	.90	.68	.39	.98	.66	.66	2.4	2.7	.74	2.2
23	.55	1.1	.85	.70	.36	.54	.45	.76	23	2.1	.82	1.5
24	.79	1.3	.91	.63	129	.42	.34	.67	4.9	5.7	.78	1.4
25	.67	1.2	.92	.74	11	.49	.43	.55	2.7	1.5	.71	1.1
26	1.0	1.1	.92	.75	.48	.48	.47	.57	4.3	4.1	.86	.99
27	.77	.83	.92	.66	.16	.64	13	.84	4.8	1.4	.82	1.1
28	.80	.65	1.0	.54	.14	1.3	23	.83	4.3	1.0	1.0	1.1
29	.66	.74	1.1	.57	9.0	13	1.5	-----	3.4	1.1	1.0	.99
30	1.0	.70	1.0	.54	1.0	4.8	.73	-----	3.6	1.2	1.1	.92
31	.92	1.1	-----	.46	-----	1.5	.69	-----	3.7	-----	1.2	-----
TOTAL	22.58	27.54	29.04	24.58	206.76	115.68	56.94	30.18	102.33	149.6	70.19	81.20
MEAN	.73	.89	.97	.79	6.89	3.73	1.84	1.08	3.30	4.99	2.26	2.71
MAX	1.0	1.3	1.4	1.2	129	53	23	11	23	13	24	5.4
MIN	.51	.39	.76	.46	.14	.29	.34	.39	.76	1.0	.71	.92
AC-FT	45	55	58	49	410	229	113	60	203	297	139	161

WTR YEAR 2002: TOTAL 916.62 MEAN 2.51 MAX 129 MIN .14 AC-FT 1,820

Peak Discharge = 2,000 cfs on November 24, 2001

Figure 13

## ALISO CREEK AT JERONIMO STATION NO. 4



**LOCATION:** Latitude  $33^{\circ} 37' 30''$ , Longitude  $117^{\circ} 41' 07''$ . On the right bank approximately 300 ft. upstream of Jeronimo Rd.

**DRAINAGE AREA:** 8.10 sq. mi (21.0 km<sup>2</sup>)

**GAGE ELEVATION:** 430 ft. (131 m) MSL

**HYDRAULIC CONTROL:** Downstream critical depth control and supercritical flow - step-designed concrete channel

**EQUIPMENT:** Stevens A-71 water-stage recorder with Balanced Beam Manometer and ALERT rain gage and water level sensor.

**PERIOD OF RECORD:** October 1930 to present

**REMARKS:** Several small conservation reservoirs in watershed above gage. Normal flow affected by return flow from irrigated areas and discharge from local supply reservoir. Low flow affected by summer algae blooms in channel.

**RATING CURVE  
ACCURACY:** Good

Table 28

**ALISO CREEK AT JERONIMO**

Station 4

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.9	.4	.4	.4	1.2	.7	1.1	2.0	1.5	1.9	2.4	1.5
2	.8	.4	.6	.8	1.1	.7	1.1	1.8	1.7	1.3	3.4	2.0
3	.8	.4	.8	.7	1.2	2.5	.8	1.6	1.7	1.6	2.4	1.7
4	.5	.4	.9	.6	1.4	.5	.7	1.7	1.6	1.6	2.5	1.2
5	.5	.4	.6	.6	1.1	.5	.8	1.7	1.4	1.7	2.5	1.2
6	.5	.5	.5	.7	.9	.4	.9	1.4	1.5	2.9	3.6	1.5
7	.4	.4	.7	.8	.9	.5	1.0	1.4	8.2	1.8	4.0	1.6
8	.4	.4	.8	1.2	.9	.5	.9	1.4	2.1	1.8	4.1	1.6
9	.4	.4	.6	1.1	1.0	.5	.9	1.5	1.5	2.0	4.3	1.8
10	.5	.4	.7	1.3	1.0	1.7	1.0	1.4	1.3	2.3	4.9	1.7
11	.4	.4	.7	1.4	1.6	.8	.9	1.7	1.5	2.3	4.3	1.7
12	.4	.4	.7	1.6	11.9	.6	1.1	1.7	1.6	2.4	4.5	1.7
13	.4	.4	.6	1.4	2.7	.5	1.2	1.7	1.2	2.0	5.0	2.2
14	.4	.5	.5	1.6	.8	.4	1.0	1.8	1.2	1.9	6.0	2.2
15	.4	.4	.5	1.6	.7	.4	1.0	1.8	1.2	3.3	7.6	2.0
16	.4	.4	.7	1.4	.9	.4	1.1	1.8	1.3	1.5	4.2	2.2
17	.4	.7	.7	1.1	.9	.4	1.4	7.2	7.4	1.6	4.3	2.2
18	.4	.5	.9	1.0	.9	.5	1.3	1.7	3.3	1.8	3.3	2.3
19	.4	.5	.8	.9	1.0	.7	1.4	1.5	1.0	2.2	4.4	2.0
20	.4	.8	.8	1.0	1.0	.7	1.5	1.3	.9	2.6	2.3	2.0
21	.4	1.2	.9	1.0	1.2	10.3	1.5	1.4	.9	2.5	2.0	2.0
22	.4	.8	.8	1.1	1.4	1.1	1.4	1.3	1.0	2.6	1.1	1.7
23	.4	.4	.9	1.3	1.0	.9	1.3	1.5	3.6	2.5	.7	1.2
24	1.0	1.2	.8	1.2	25.0	.8	1.1	1.5	1.2	10.3	.8	1.2
25	.8	.9	.7	1.1	1.6	.8	2.1	1.4	1.2	2.0	.9	.9
26	.6	.7	.8	.8	.9	.8	2.3	1.5	1.3	2.8	1.0	1.1
27	.5	.4	.7	.8	1.1	.9	6.2	1.3	1.6	1.8	1.0	1.1
28	.5	.6	.7	.8	1.3	1.1	20.3	1.4	1.9	1.7	1.0	.9
29	.6	.4	.5	.8	3.9	3.5	4.2	-----	2.2	1.9	1.0	.7
30	.9	.4	.5	.8	1.2	3.9	2.0	-----	2.2	2.3	1.1	.7
31	.7	.4	-----	2.8	-----	1.5	1.8	-----	2.3	-----	1.2	-----
TOTAL	16.5	16.5	20.8	33.7	71.7	39.5	65.3	49.4	62.5	70.9	91.8	47.8
MEAN	.5	.5	.7	1.1	2.4	1.3	2.1	1.8	2.0	2.4	3.0	1.6
MAX	1.0	1.2	.9	2.8	25.0	10.3	20.3	7.2	8.2	10.3	7.6	2.3
MIN	.4	.4	.4	.4	.7	.4	.7	1.3	.9	1.3	.7	.7
AC-FT	32.7	32.7	41.3	66.8	142	78.3	130	98.0	124	141	182	94.8

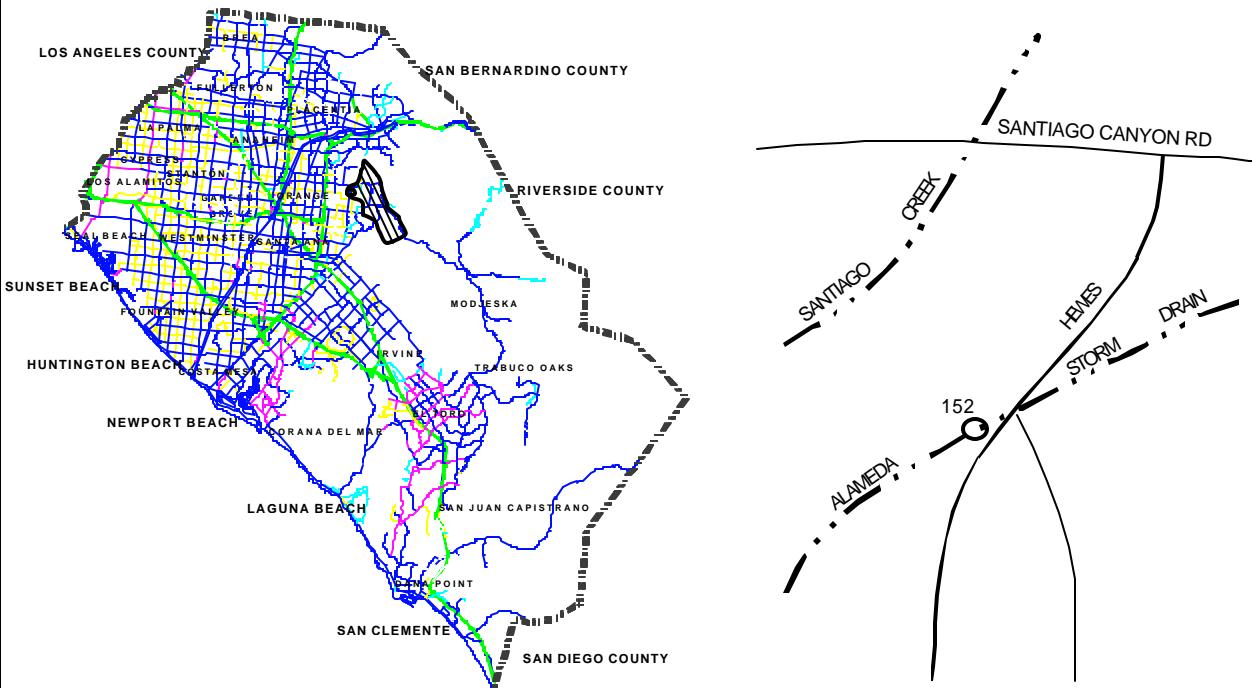
WTR YEAR 2002: TOTAL 586.4 MEAN 1.6 MAX 25.0 MIN .4 AC-FT 1,164

Peak Discharge = 254 cfs on November 24, 2001

Figure 14

# **ALAMEDA STORM CHANNEL AT HEWES**

## **STATION NO. 152**



<b>LOCATION:</b>	Latitude $33^{\circ} 48' 21''$ , Longitude $117^{\circ} 48' 06''$ . Approximately 200 ft. downstream of Santiago Blvd. On the north side of Hewes Ave.
<b>DRAINAGE AREA:</b>	3.20 sq. mi. (8.28 km <sup>2</sup> )
<b>GAGE ELEVATION:</b>	339 ft. (103 m) MSL
<b>HYDRAULIC CONTROL:</b>	Supercritical flow - concrete lined, rectangular channel.
<b>EQUIPMENT:</b>	Stevens A-71 water-stage recorder with float, ALERT rain gage and water level sensor.
<b>PERIOD OF RECORD:</b>	December 1937 to June 1962, October 1965 to 1983, and July 1989 to present
<b>REMARKS:</b>	No regulation or diversion above gage.
<b>RATING CURVE</b>	
<b>ACCURACY:</b>	Good

Table 29

**ALAMEDA STORM CHANNEL AT HEWES**

Station 152

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

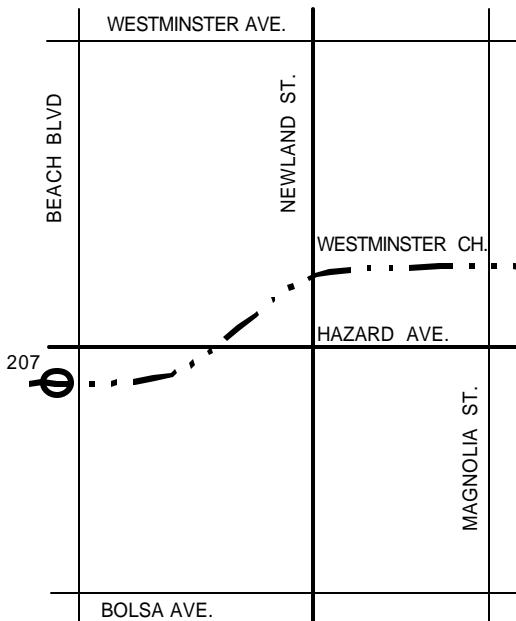
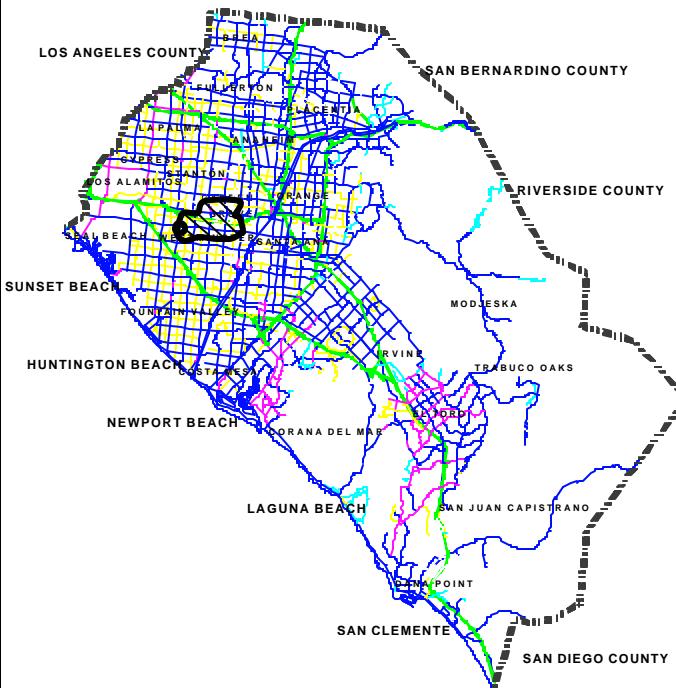
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.08	.04	.13	.03	.03	.18	.24	.13	.08	.10	.14	.06
2	.07	.04	.10	.07	.02	.14	.20	.12	.15	.11	.13	.08
3	.09	.01	.07	.05	.01	.17	.28	.13	.16	.12	.15	.06
4	.14	.01	.13	.03	.06	.10	.21	.15	.14	.11	.15	.05
5	.09	.01	.08	.02	.02	.05	.22	.15	.07	.13	.16	.04
6	.09	.02	.12	.04	.01	.03	.20	.13	.05	.21	.12	.06
7	.09	.01	.11	.02	.01	.05	.16	.13	.28	.16	.14	.03
8	.08	.04	.12	.02	.03	.10	.18	.17	.06	.13	.14	.06
9	.10	.11	.09	.05	0	.08	.15	.13	.05	.18	.12	.04
10	.10	.10	.14	.02	0	.05	.16	.13	.04	.13	.09	.02
11	.10	.12	.11	.04	.04	.02	.15	.16	.03	.13	.10	.03
12	.09	.11	.15	.05	.63	.02	.23	.19	.02	.17	.06	.04
13	.07	.10	.17	.12	.05	.01	.24	.20	.03	.18	.08	.03
14	.06	.10	.15	.07	.02	.09	.27	.20	.04	.17	.09	.03
15	.07	.07	.13	.08	.02	.03	.17	.20	.07	.34	.05	.04
16	.12	.10	.10	.08	.03	.04	.30	.20	.07	.15	.10	.05
17	.07	.07	.05	.06	.03	.10	.21	.56	.21	.12	.09	.04
18	.07	.10	.14	.06	.04	.11	.19	.11	.12	.16	.16	.05
19	.14	.08	.11	.06	.03	.12	.23	.20	.14	.16	.26	.05
20	.01	.06	.13	.09	.04	.12	.18	.10	.16	.12	.28	.05
21	.01	.11	.14	.06	.04	1.0	.18	.07	.15	.09	.12	.09
22	.02	.14	.02	.07	.01	.19	.23	.08	.16	.13	.15	.10
23	.02	.07	.05	.13	.05	.18	.17	.09	.16	.10	.13	.09
24	.04	.08	.05	.04	1.5	.17	.19	.12	.14	.23	.13	.09
25	.02	.12	.04	.10	.12	.15	.23	.12	.14	.13	.14	.08
26	.02	.10	.03	.01	.11	.18	.22	.10	.11	.21	.13	.07
27	.02	.11	.06	.01	.12	.27	.40	.05	.11	.17	.12	.09
28	.01	.12	.09	.01	.08	.22	1.8	.07	.10	.18	.09	.10
29	.01	.13	.01	.02	.35	.79	.22	-----	.11	.13	.07	.12
30	.01	.15	.03	.02	.15	.47	.11	-----	.12	.16	.10	.09
31	.02	.11	-----	.03	-----	.26	.09	-----	.12	-----	.10	-----
TOTAL	1.93	2.54	2.85	1.56	3.65	5.49	8.01	4.19	3.39	4.61	3.89	1.83
MEAN	.062	.082	.095	.050	.12	.18	.26	.15	.11	.15	.13	.061
MAX	.14	.15	.17	.13	1.5	1.0	1.8	.56	.28	.34	.28	.12
MIN	.01	.01	.01	.01	0	.01	.09	.05	.02	.09	.05	.02
AC-FT	3.8	5.0	5.7	3.1	7.2	11	16	8.3	6.7	9.1	7.7	3.6

WTR YEAR 2002: TOTAL 43.94 MEAN .12 MAX 1.8 MIN 0 AC-FT 87

Peak Discharge = 45 cfs on December 21, 2001

Figure 15

## WESTMINSTER CHANNEL AT BEACH BLVD. STATION NO. 207



**LOCATION:** Latitude  $33^{\circ} 45' 07''$ , Longitude  $117^{\circ} 59' 26''$ . on the right bank approximately 300 ft. downstream of Beach Blvd.

**DRAINAGE AREA:** 6.70 sq. mi. ( $17.3 \text{ km}^2$ )

**GAGE ELEVATION:** 40.0 ft. (12.0 m) MSL

**HYDRAULIC CONTROL:** Subcritical flow - concrete lined, trapezoidal channel.

**EQUIPMENT:** Stevens A-71 water-stage recorder with float, ALERT rain gage and water level sensor.

**PERIOD OF RECORD:** October 1955 to present

**REMARKS:** Prior to July 1968 the gage was located approximately 295 ft. upstream of Beach Blvd. No regulation or diversion above gage.

**RATING CURVE  
ACCURACY:** Fair

Table 30

## WESTMINSTER CHANNEL AT HAZARD

Station 207

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

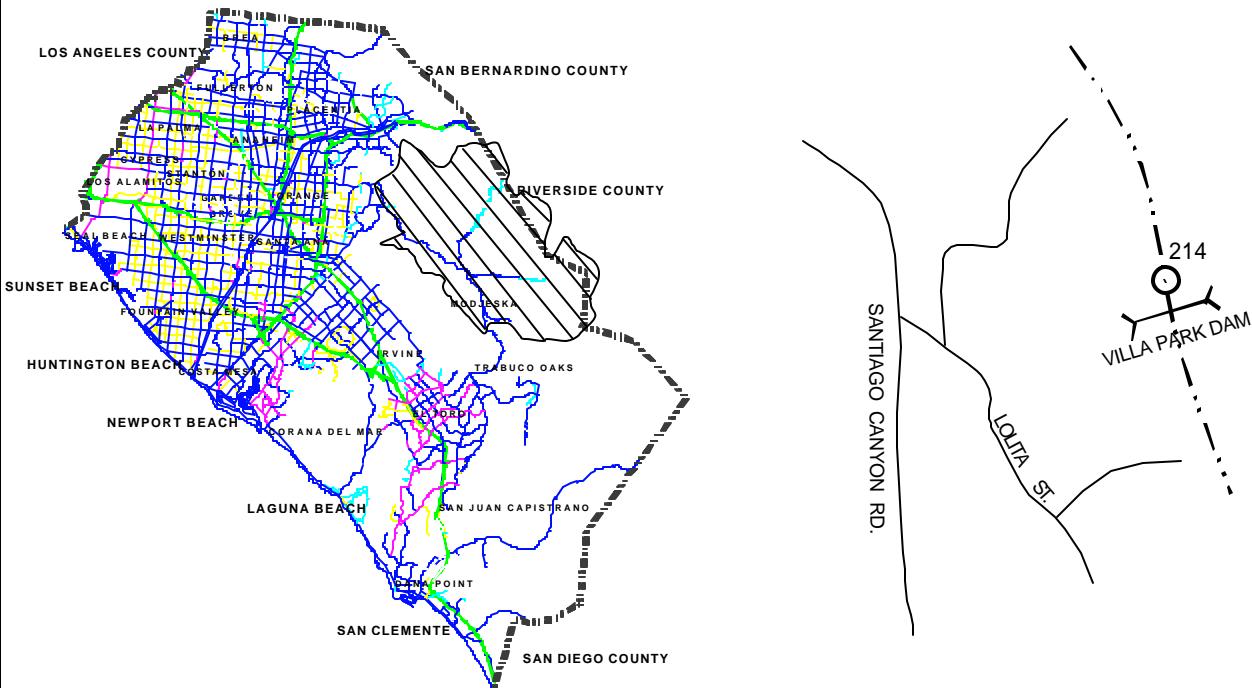
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.20	.18	.67	.44	.25	.19	.18	.17	.32	.15	.66	.18
2	.19	.17	.45	.36	.26	.18	.18	.17	.11	.16	1.1	.18
3	.20	.18	.25	.36	.32	7.1	.19	.17	1.1	.12	.96	.19
4	.20	.19	.67	.50	.41	.19	.18	.17	.10	.14	.92	.57
5	.25	.19	.15	.60	.39	.19	.18	.17	.44	.13	1.0	.74
6	.27	.19	.12	.52	.30	.16	.19	.16	1.5	.95	1.3	.58
7	.35	.19	.15	.25	.30	.14	.18	.17	.58	.19	.43	.62
8	.32	.19	.15	.25	.30	.10	.18	.16	1.5	.16	.30	.62
9	.27	.20	.16	.26	.37	.10	.18	.12	.16	.10	.44	.58
10	.23	.19	.17	.30	.48	.11	.18	.09	2.0	.17	.43	.59
11	.20	.19	.17	.31	.90	.32	.17	.09	.17	.19	.31	.74
12	.20	.19	.18	.23	20	.09	.17	.09	.31	.17	.19	.77
13	.19	.19	.19	.23	1.7	.11	.16	.11	.21	.16	.28	.93
14	.19	.19	.21	.25	.27	4.5	.16	.09	.32	.20	.37	.75
15	.19	.19	.25	.22	.25	.11	.16	.09	.31	1.2	.35	.95
16	.20	.20	.37	.25	.20	.09	.16	.11	.23	.20	.20	.95
17	.20	.20	.54	.29	.19	.09	.16	11	4.2	.18	.18	.81
18	.20	.20	.74	.20	.19	.09	.15	.18	2.2	.21	.24	.40
19	.20	.20	.91	.20	.19	.09	.11	.15	.39	.17	.17	.18
20	.22	.17	1.2	.22	.18	.13	.09	.15	.23	.17	2.9	.20
21	.20	.17	1.3	.26	.17	13	.09	.16	.19	.24	.18	.19
22	.25	.16	1.3	.32	.17	.16	.14	1.3	.26	.21	.17	.17
23	.21	.19	1.4	.39	.17	.16	.24	.14	.35	.28	.17	.16
24	.20	.21	1.4	.49	22	.16	.15	.15	.28	2.1	.17	.16
25	.19	.18	1.4	.29	.35	.17	.10	.15	.22	.36	.17	.15
26	.20	.18	1.3	.80	.23	.17	.17	.27	.37	1.0	.18	.11
27	.17	.18	1.3	.46	.21	.19	9.7	1.8	.27	.34	.17	.09
28	.17	.19	1.2	.28	.21	.25	5.9	.15	.25	.26	.18	.08
29	.17	.22	1.0	.30	6.4	22	.26	-----	.24	.36	.18	.09
30	.17	.46	.61	.28	.19	12	.18	-----	.23	.73	.18	.09
31	.18	.78	-----	.25	-----	.99	.17	-----	.18	-----	.18	-----
TOTAL	6.58	6.71	19.91	10.36	57.55	63.33	20.41	17.73	19.22	11.00	14.66	12.82
MEAN	.21	.22	.66	.33	1.92	2.04	.66	.63	.62	.37	.47	.43
MAX	.35	.78	1.4	.80	22	22	9.7	11	4.2	2.1	2.9	.95
MIN	.17	.16	.12	.20	.17	.09	.09	.09	.10	.10	.17	.08
AC-FT	13	13	39	21	114	126	40	35	38	22	29	25

WTR YEAR 2002: TOTAL 260.28 MEAN .71 MAX 22 MIN .08 AC-FT 516

Peak Discharge = 270 cfs on November 24, 2002

Figure 16

## SANTIAGO CREEK AT VILLA PARK DAM STATION NO. 214



<b>LOCATION:</b>	Latitude $33^{\circ} 48' 58''$ , Longitude $117^{\circ} 45' 55''$ . Approximately 190 ft. downstream from the toe of the dam.
<b>DRAINAGE AREA:</b>	83.4 sq. mi. ( $216 \text{ km}^2$ ) including 63.1 sq. mi. ( $163 \text{ km}^2$ ) above Santiago Dam
<b>GAGE ELEVATION:</b>	470 ft. (143 m) MSL
<b>HYDRAULIC CONTROL:</b>	Downstream Weir, upstream diversion and concrete lined, trapezoidal channel.
<b>EQUIPMENT:</b>	Stevens A-71 remote registering water-stage recorder at concrete weir, and ALERT rain gage with wind speed and direction sensor.
<b>PERIOD OF RECORD:</b>	January 1963 to present
<b>REMARKS:</b>	Flow regulated by Villa Park Dam and Santiago Reservoir. In addition to the outlet gate discharges and spilling flows, amounts reported include evaporation from the reservoir, seepage losses, and water flowing through the discharge pipeline controlled by the Serrano Water District.
<b>RATING CURVE ACCURACY:</b>	Excellent

Table 31

**SANTIAGO CREEK AT VILLA PARK DAM**

Station 214

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

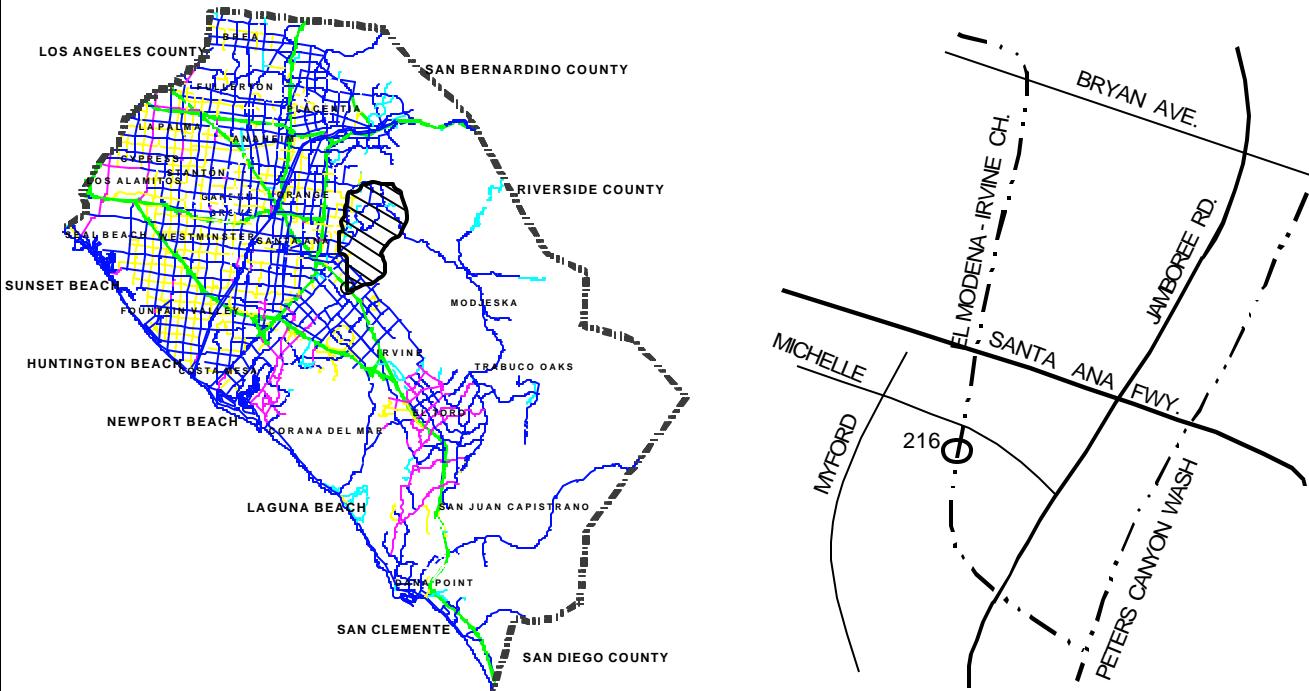
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	2.7	1.4	.44	.33	.12	.08	.08	.11	.07	.10	.06	.07
2	1.3	4.2	.37	.30	.13	.05	.08	.08	.07	.10	.10	.04
3	.57	3.9	.39	.20	.10	.08	.08	.08	.10	.06	.06	.04
4	.57	3.9	.39	.15	.13	.08	.08	.12	.10	.10	.06	.07
5	.57	3.9	.39	.15	.10	.12	.12	.11	.10	.06	.10	.07
6	.57	1.3	.39	.12	.13	.08	.08	.12	.10	.06	.06	.04
7	.57	.76	.34	.07	.13	.12	.05	.08	.10	.06	.10	.04
8	.64	.76	.34	.15	.10	.12	.12	.12	.10	.10	.06	.07
9	.64	.80	.30	.12	.13	.15	.08	.08	.10	.06	.10	.07
10	.71	.75	.34	.12	.17	.15	.11	.08	.10	.06	.06	.04
11	.71	.75	.30	.07	.13	.15	.12	.15	.10	.06	.06	.04
12	.71	.79	.37	.07	.13	.15	.15	.15	.10	.06	.10	.04
13	.83	.74	.41	.15	.10	.12	.15	.15	.10	.10	.06	.04
14	.95	.69	.41	.12	.10	.12	.15	.12	.10	.06	.10	.07
15	.78	.72	.41	.15	.03	.12	.12	.12	.10	.06	.06	.04
16	.42	.69	.37	.15	.13	.12	.15	.12	.10	.10	.06	.04
17	.30	.41	.30	.20	.17	.12	.15	.12	.10	.06	.06	.07
18	.30	.72	.33	.20	.17	.08	.12	.08	.10	.10	.10	.07
19	.25	.93	.28	.17	.17	.12	.15	.08	.10	.06	.06	.07
20	.20	.89	.33	.17	.13	.08	.12	.04	.10	.10	.05	.03
21	.20	.75	.30	.12	.17	.08	.12	.08	.07	.06	.05	.07
22	.20	.75	.28	.12	.10	.12	.11	.15	.10	.06	.05	.07
23	.20	.61	.28	.12	.10	.08	.12	.12	.10	.10	.05	.07
24	.20	.30	.30	.15	.06	.08	.12	.12	.10	.06	.05	.07
25	.18	.30	.30	.18	.13	.08	.12	.12	.10	.10	.05	.07
26	.18	.33	.30	.18	.13	.08	.12	.11	.06	.06	.04	.07
27	.16	.37	.30	.15	.10	.08	.11	.12	.03	.06	.04	.07
28	.16	.33	.33	.15	.13	.12	.08	.12	.07	.10	.04	.07
29	.16	.37	.30	.15	.10	.08	.12	-----	.10	.06	.04	.07
30	.16	.40	.33	.07	.10	.12	.12	-----	.06	.10	.07	.07
31	.16	.40	-----	.15	-----	.08	.08	-----	.10	-----	.04	-----
TOTAL	16.25	33.91	10.22	4.70	3.62	3.21	3.48	3.05	2.83	2.28	1.99	1.76
MEAN	.52	1.09	.34	.15	.12	.10	.11	.11	.091	.076	.064	.059
MAX	2.7	4.2	.44	.33	.17	.15	.15	.15	.10	.10	.10	.07
MIN	.16	.30	.28	.07	.03	.05	.05	.04	.03	.06	.04	.03
AC-FT	32	67	20	9.3	7.2	6.4	6.9	6.0	5.6	4.5	3.9	3.5

WTR YEAR 2002: TOTAL 87.30 MEAN .24 MAX 4.2 MIN .03 AC-FT 173

Peak Discharge = 20 cfs on September 13, 2001

Figure 17

## EL MODENA-IRVINE CHANNEL AT MICHELLE STATION NO. 216



<b>LOCATION:</b>	Latitude $33^{\circ} 43' 12''$ , Longitude $117^{\circ} 47' 54''$ . On the right bank approximately 100 feet upstream of the Michelle Ave. Bridge.
<b>DRAINAGE AREA:</b>	11.9 sq. mi. ( $31.0 \text{ km}^2$ )
<b>GAGE ELEVATION:</b>	73 ft. (23.3 m) MSL
<b>HYDRAULIC CONTROL:</b>	Supercritical flow-concrete lined, rectangular channel.
<b>EQUIPMENT:</b>	Stevens A-71 water-stage recorder with Balanced Beam Manometer, ALERT rain gage and water level sensor.
<b>PERIOD OF RECORD:</b>	March 1967 to present
<b>REMARKS:</b>	The gaging station has been relocated twice: 1) in 1986 when the gage was moved several hundred feet upstream to the D/S right bank of the michelle street bridge and 2) in 1994 when the gage was moved 100 feet U/S to its present location.
<b>RATING CURVE ACCURACY:</b>	Good

Table 32

**EL MODENA-IRVINE AT MICHELLE**

Station 216

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

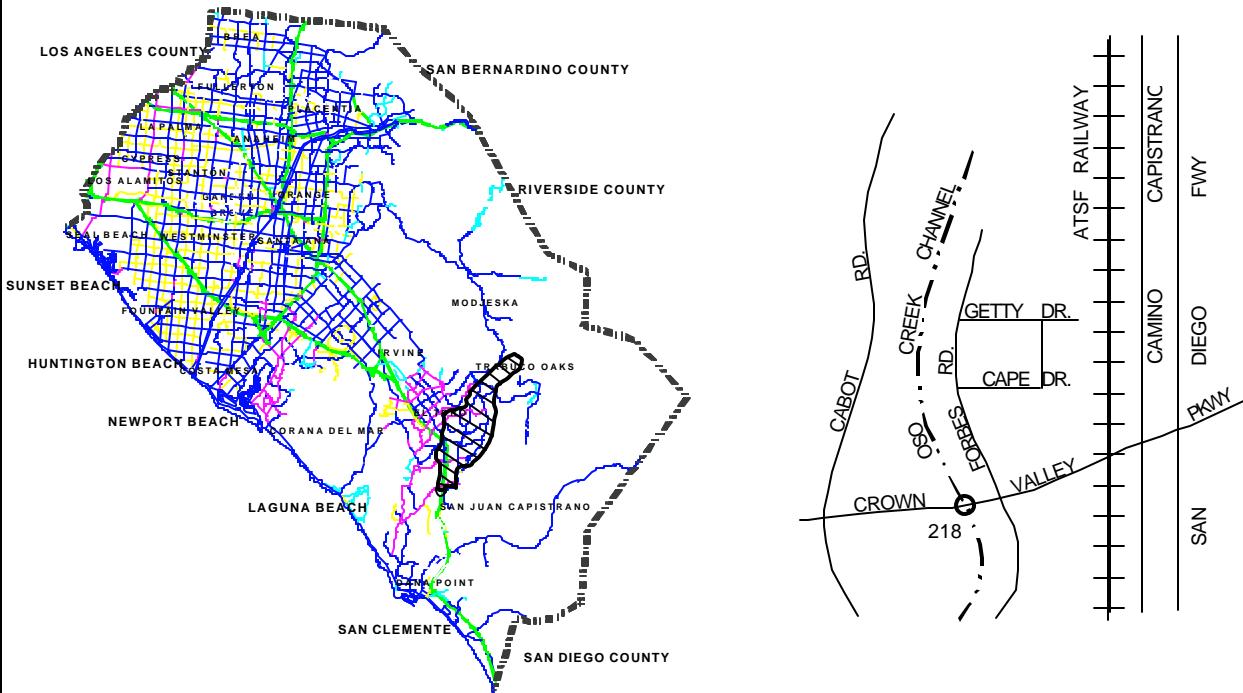
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	2.1	1.1	2.2	.88	.96	1.2	.92	.78	1.3	2.0	2.5	1.4
2	2.4	1.3	1.7	.86	1.1	1.4	.92	.80	1.4	1.3	2.6	1.5
3	2.5	1.8	1.9	.88	1.0	2.7	1.6	.80	1.6	1.1	2.5	1.8
4	1.9	1.5	1.8	.97	.94	.87	1.1	.85	1.9	1.1	2.6	2.2
5	2.4	1.4	2.5	1.0	.91	.81	1.0	.87	1.3	1.6	2.6	2.0
6	2.4	1.6	2.6	1.0	.88	.85	1.2	.90	1.7	3.7	2.6	2.3
7	2.4	1.8	2.3	1.0	.85	.97	.96	.88	9.1	1.3	2.6	2.4
8	2.1	1.5	2.4	.97	.89	.90	1.1	.82	1.6	1.4	2.7	2.7
9	1.7	1.9	2.4	.97	.83	1.1	1.0	.91	1.2	2.2	2.7	2.6
10	1.7	2.2	2.5	.97	.86	3.3	.93	.82	1.2	1.9	2.6	1.7
11	1.8	1.8	2.3	1.0	.84	1.1	1.0	1.0	1.3	3.2	2.7	1.7
12	1.8	2.1	2.1	.97	.91	.85	1.1	.97	1.4	2.8	2.7	2.2
13	2.1	2.1	2.0	.97	18 E	.89	.91	.93	1.3	1.6	2.6	2.1
14	1.3	2.3	2.2	.98	1.2	13	.96	1.0	3.0	1.3	2.8	2.9
15	1.3	2.1	2.1	.96	1.1	1.2	1.1	1.5	2.9	3.5	2.8	1.4
16	1.8	2.0	1.6	.92	1.1	.98	1.3	1.1	1.6	1.6	2.7	.99
17	1.7	2.3	.89	.91	1.0	1.2	.99	10	4.4	1.7	2.4	.99
18	1.7	2.2	.88	.95	1.0	.89	.98	1.5	2.3	1.4	2.3	.82
19	1.6	2.1	.91	.95	1.0	.94	1.0	1.2	1.6	1.6	4.5	.89
20	2.4	2.3	.90	.90	.92	1.9	1.0	1.5	1.2	.89	2.8	1.2
21	1.9	2.2	.87	.90	.93	17	1.1	1.7	1.8	.82	1.6	1.5
22	1.9	2.1	.88	.91	.88	1.5	1.3	.96	1.6	.99	1.9	1.1
23	2.2	1.9	.92	.90	.88	.95	1.5	1.0	3.7	1.1	1.8	1.0
24	2.3	1.9	.90	.90	41 E	1.0	1.1	1.0	1.5	4.4	2.3	1.3
25	2.6	1.9	.86	.91	1.1	.97	1.1	1.0	1.9	1.5	2.1	1.4
26	2.5	1.7	.81	.93	1.1	.96	1.0	1.0	1.2	2.4	2.0	1.0
27	2.5	2.0	.86	1.1	1.1	.91	9.8	1.2	1.4	1.9	2.8	.85
28	3.0	2.3	.88	1.0	.95	.89	33	1.6	1.2	1.8	3.0	.91
29	2.0	2.3	.87	1.1	11	8.6	1.9	-----	1.2	2.3	3.2	1.1
30	1.8	2.1	.83	1.1	1.1	8.0	.96	-----	1.1	1.9	2.3	1.1
31	1.2	2.2	-----	1.1	-----	1.2	1.1	-----	1.2	-----	1.4	-----
TOTAL	63.0	60.0	46.86	29.86	96.33	79.03	74.93	38.59	61.1	56.30	78.7	47.05
MEAN	2.03	1.94	1.56	.96	3.21	2.55	2.42	1.38	1.97	1.88	2.54	1.57
MAX	3.0	2.3	2.6	1.1	41	17	33	10	9.1	4.4	4.5	2.9
MIN	1.2	1.1	.81	.86	.83	.81	.91	.78	1.1	.82	1.4	.82
AC-FT	125	119	93	59	191	157	149	77	121	112	156	93

WTR YEAR 2002: TOTAL 731.75 MEAN 2.00 MAX 41 MIN .78 AC-FT 1,450

Peak Discharge = 723 cfs on January 28, 2002 E= Estimated

Figure 18

## OSO CREEK AT CROWN VALLEY PARKWAY STATION NO. 218



<b>LOCATION:</b>	Latitude $33^{\circ}33' 29''$ , Longitude $117^{\circ}40' 33''$ . On the right bank approximately 1200 ft. west of the intersection of Crown Valley Parkway and San Diego Freeway.
<b>DRAINAGE AREA:</b>	14.0 sq. mi. ( $36.2 \text{ km}^2$ )
<b>GAGE ELEVATION:</b>	250 ft. (76.0 m) MSL
<b>HYDRAULIC CONTROL:</b>	Downstream critical depth control and supercritical and subcritical flow trapezoidal, rip rap/earthen channel.
<b>EQUIPMENT:</b>	Stevens A-71 water-stage recorder with float, ALERT rain gage and water level sensor.
<b>PERIOD OF RECORD:</b>	December 1969 to present
<b>REMARKS:</b>	A grouted rock structure about 130 ft. downstream of the gage serves as the control for low to medium-high stages.
<b>RATING CURVE</b> <b>ACCURACY:</b>	Fair

Table 33

**OSO CREEK AT CROWN VALLEY PARKWAY**

Station 218

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

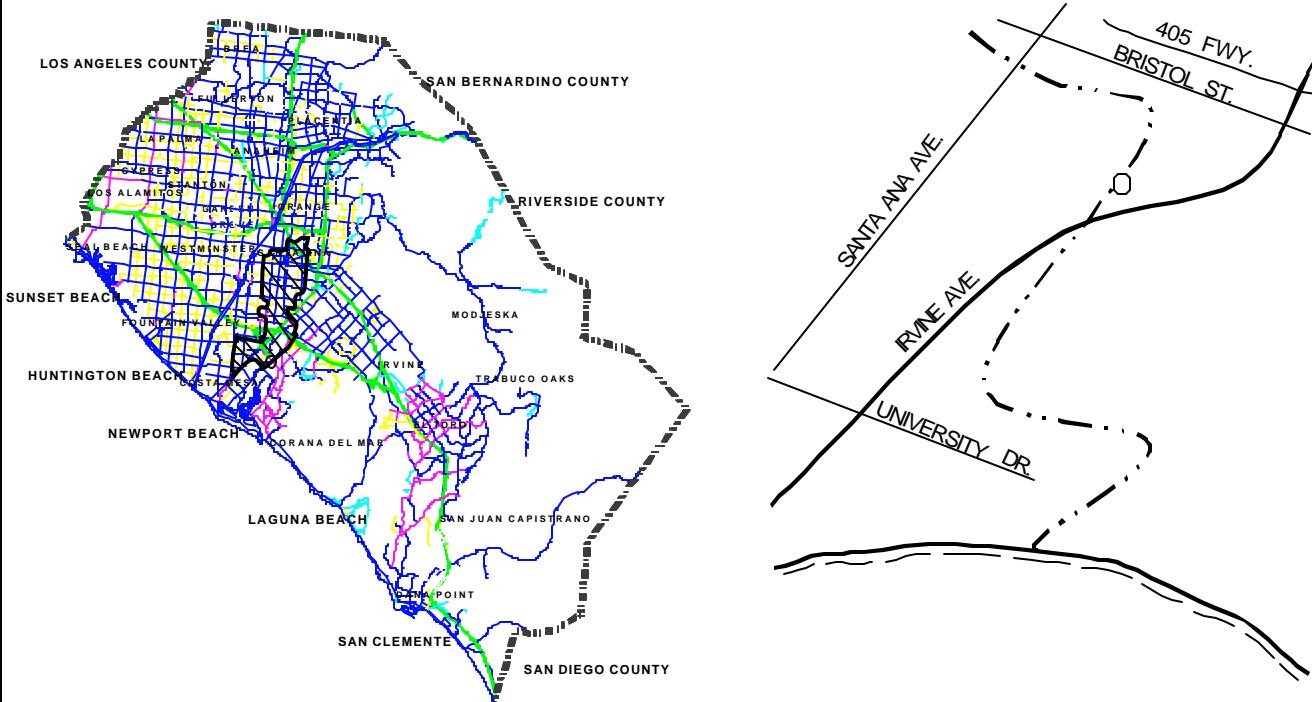
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	2.8	2.8	2.8	1.4	1.8	2.8	3.1	1.8	3.1	3.1	1.7	1.3
2	2.8	2.8	2.8	1.4	1.8	2.8	3.3	1.8	2.6	3.2	1.7	1.4
3	2.8	2.8	2.7	1.4	1.7	20	2.8	1.8	2.4	3.2	1.8	1.6
4	2.8	2.8	2.7	1.4	2.7	3.1	2.7	1.7	2.8	3.0	1.9	1.7
5	2.8	2.8	2.7	1.4	2.1	2.9	2.7	1.8	2.8	2.9	1.9	1.7
6	2.8	2.8	2.8	1.3	1.8	2.7	2.5	2.2	3.3	8.1	1.9	1.5
7	2.7	2.8	2.7	1.3	1.9	2.6	2.5	2.1	36	3.1	2.1	1.5
8	2.7	2.7	2.6	1.5	1.7	2.8	2.5	2.1	6.0	3.5	2.2	1.4
9	2.7	2.8	2.4	1.5	1.9	3.2	2.6	2.0	2.5	3.0	1.8	1.4
10	2.7	2.7	2.4	1.4	1.8	6.9	2.4	1.6	2.4	2.7	1.9	1.3
11	2.7	2.8	2.3	1.3	2.6	3.8	2.7	2.1	2.6	2.9	1.7	1.3
12	2.8	2.8	2.2	1.4	52	2.9	2.5	2.1	2.5	3.0	1.7	1.4
13	2.8	2.7	2.2	1.3	11	2.6	2.5	2.1	2.7	2.6	1.7	1.8
14	2.7	2.8	2.1	1.3	2.1	29	2.6	2.1	2.6	2.6	1.8	1.3
15	2.8	2.8	2.1	1.3	1.7	4.4	2.7	2.0	2.7	9.3	1.6	1.2
16	2.7	2.7	1.9	1.4	1.5	2.9	3.4	2.2	2.5	2.6	1.6	1.2
17	2.8	2.7	1.9	1.3	1.4	2.9	4.9	14	19	2.3	1.4	1.2
18	2.8	2.7	1.9	1.3	1.7	2.7	2.7	3.0	12	2.2	1.3	1.3
19	2.7	2.8	1.8	1.3	1.7	2.8	2.4	2.1	2.6	2.4	1.8	1.3
20	2.8	2.8	2.0	1.2	1.7	2.8	2.4	2.3	2.6	2.4	1.7	1.3
21	2.7	2.8	1.6	1.3	1.8	90	2.9	2.2	2.5	2.3	1.5	1.3
22	2.8	2.8	1.4	1.5	1.7	4.1	2.2	2.3	2.8	2.5	1.5	1.2
23	2.8	2.8	1.8	1.6	1.8	3.0	2.4	2.1	14	1.9	1.5	1.4
24	2.7	2.8	2.1	1.6	321	2.8	2.1	2.2	6.4	19	1.6	1.3
25	2.8	2.7	1.5	1.7	9.4	2.6	2.3	2.6	3.0	1.9	1.3	1.5
26	2.8	2.7	2.3	1.7	4.0	2.8	2.4	2.7	3.0	1.5	1.3	1.3
27	2.7	2.7	1.7	1.5	3.3	2.7	21	2.8	3.1	1.3	1.5	1.5
28	2.8	2.7	1.5	1.5	3.2	2.7	74	2.8	3.0	1.3	1.5	1.5
29	2.8	2.8	1.2	1.7	21	14	9.0	-----	3.0	1.5	1.4	1.3
30	2.7	2.8	1.2	1.8	4.6	18	2.5	-----	2.9	1.6	1.2	1.5
31	2.8	2.8	-----	1.8	-----	6.2	2.0	-----	2.6	-----	1.4	-----
TOTAL	85.6	85.8	63.3	44.8	468.4	255.5	178.7	72.6	162.0	102.9	50.9	41.9
MEAN	2.76	2.77	2.11	1.45	15.6	8.24	5.76	2.59	5.23	3.43	1.64	1.40
MAX	2.8	2.8	2.8	1.8	321	90	74	14	36	19	2.2	1.8
MIN	2.7	2.7	1.2	1.2	1.4	2.6	2.0	1.6	2.4	1.3	1.2	1.2
AC-FT	170	170	126	89	929	507	354	144	321	204	101	83

WTR YEAR 2002: TOTAL 1,612.4 MEAN 4.42 MAX 321 MIN 1.2 AC-FT 3,200

Peak Discharge = 2,780 cfs on November 24, 2001

Figure 19

## SANTA ANA-DELHI CHANNEL AT IRVINE STATION NO. 220



<b>LOCATION:</b>	Latitude $33^{\circ} 39' 36''$ , Longitude $117^{\circ} 52' 49''$ . On the left bank approximately 600 ft. upstream of Irvine Avenue.
<b>DRAINAGE AREA:</b>	17.6 sq. mi (45.6 km <sup>2</sup> )
<b>GAGE ELEVATION:</b>	21.8 ft. (6.6 m) MSL
<b>HYDRAULIC CONTROL:</b>	Subcritical flow - rectangular, concrete channel with V-bottom.
<b>EQUIPMENT:</b>	Stevens A-71 water-stage recorder with Balanced Beam Manometer and ALERT rain gage and water level sensor.
<b>PERIOD OF RECORD:</b>	December 1, 1989. Additional records available for location 600 ft downstream for the period 1971 to 1986.
<b>REMARKS:</b>	Discharge data required for sediment TMDL compliance program
<b>RATING CURVE ACCURACY:</b>	Good

Table 34

**SANTA ANA-DELHI CHANNEL AT IRVINE AVE.**

Station 220

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	2.6	2.9	2.0	1.6	1.9	18.5	8.8	14.6	9.4	2.6	2.5	2.0
2	2.2	3.0	1.8	1.8	1.9	17.2	7.8	14.1	2.8	2.9	2.5	1.4
3	2.9	2.7	1.8	1.9	1.6	26.2	5.1	4.6	4.0	3.0	3.0	1.4
4	2.6	2.7	1.9	2.2	3.1	15.5	2.1	7.9	13.0	3.0	2.2	1.4
5	6.7	2.2	2.1	2.2	1.9	14.5	2.0	14.2	9.2	2.9	2.2	1.6
6	2.8	2.6	1.8	2.3	1.1	14.2	1.8	13.3	4.4	6.7	2.1	1.7
7	2.5	3.0	1.8	2.1	1.4	14.9	1.7	15.1	23.5	3.2	2.3	1.9
8	2.3	2.5	1.9	2.1	1.3	14.3	1.1	14.7	4.1	3.0	1.8	2.1
9	2.5	2.7	1.6	2.0	1.3	15.1	1.1	13.6	3.8	3.7	2.5	1.2
10	2.8	2.6	2.1	2.4	1.3	16.0	5.4	11.9	3.1	3.0	1.8	1.8
11	2.6	2.7	1.9	2.5	1.9	15.6	10.5	12.1	2.6	2.8	2.0	1.7
12	2.9	2.3	2.3	2.3	40.9	4.8	11.1	12.8	3.0	2.9	1.6	1.3
13	2.8	2.5	1.7	2.3	5.8	7.2	11.5	13.1	3.1	2.5	1.6	1.3
14	2.6	2.9	1.7	2.1	2.0	20.1	12.4	13.2	3.8	2.3	1.6	1.3
15	2.3	3.0	1.6	2.6	1.8	7.2	15.1	13.4	3.4	4.7	1.5	1.3
16	3.0	3.0	1.6	2.8	1.7	6.0	12.7	13.1	3.3	9.9	2.6	1.1
17	2.9	3.2	1.4	2.3	1.7	5.3	13.6	29.2	12.9	11.5	1.5	1.5
18	2.5	3.2	1.2	2.5	1.5	6.0	12.4	13.8	9.7	3.7	1.5	1.6
19	3.0	2.8	1.3	2.3	1.7	6.2	14.0	12.7	3.5	3.1	1.7	2.3
20	3.0	2.7	1.3	2.7	1.8	6.0	13.1	13.2	7.6	3.0	1.4	1.9
21	3.4	2.8	1.4	2.7	1.7	33.2	12.2	12.6	7.4	2.3	1.2	2.1
22	2.9	3.2	1.6	5.1	2.0	8.1	13.0	13.0	2.1	2.3	1.8	2.0
23	2.8	2.9	1.6	1.8	2.0	7.9	12.1	13.2	10.2	2.3	1.3	1.7
24	2.7	2.6	1.7	1.9	69.0	7.9	11.7	13.1	2.5	4.4	1.3	1.9
25	3.1	2.4	1.7	2.2	4.9	8.0	12.0	11.4	2.3	2.6	1.3	2.1
26	2.9	2.1	1.9	1.7	4.1	7.6	12.5	3.6	3.8	4.6	1.3	2.3
27	2.6	2.3	2.0	1.5	9.0	6.9	26.0	2.9	5.0	2.3	1.5	2.4
28	2.6	2.6	1.9	1.5	19.1	7.0	63.2	3.6	3.2	2.0	1.3	2.5
29	2.4	2.4	1.7	1.8	48.5	27.1	14.5	-----	2.9	2.4	1.4	1.7
30	2.9	2.4	1.7	2.1	20.1	24.4	15.8	-----	2.9	2.3	1.3	1.6
31	3.4	2.5	-----	2.0	-----	10.9	14.4	-----	3.0	-----	2.1	-----
TOTAL	89.2	83.4	52.0	69.3	258.0	399.8	370.7	344.0	175.5	107.9	55.7	52.1
MEAN	2.9	2.7	1.7	2.2	8.6	12.9	12.0	12.3	5.7	3.6	1.8	1.7
MAX	6.7	3.2	2.3	5.1	69.0	33.2	63.2	29.2	23.5	11.5	3.0	2.5
MIN	2.2	2.1	1.2	1.5	1.1	4.8	1.1	2.9	2.1	2.0	1.2	1.1
AC-FT	177	165	103	137	512	793	735	682	348	214	110	103

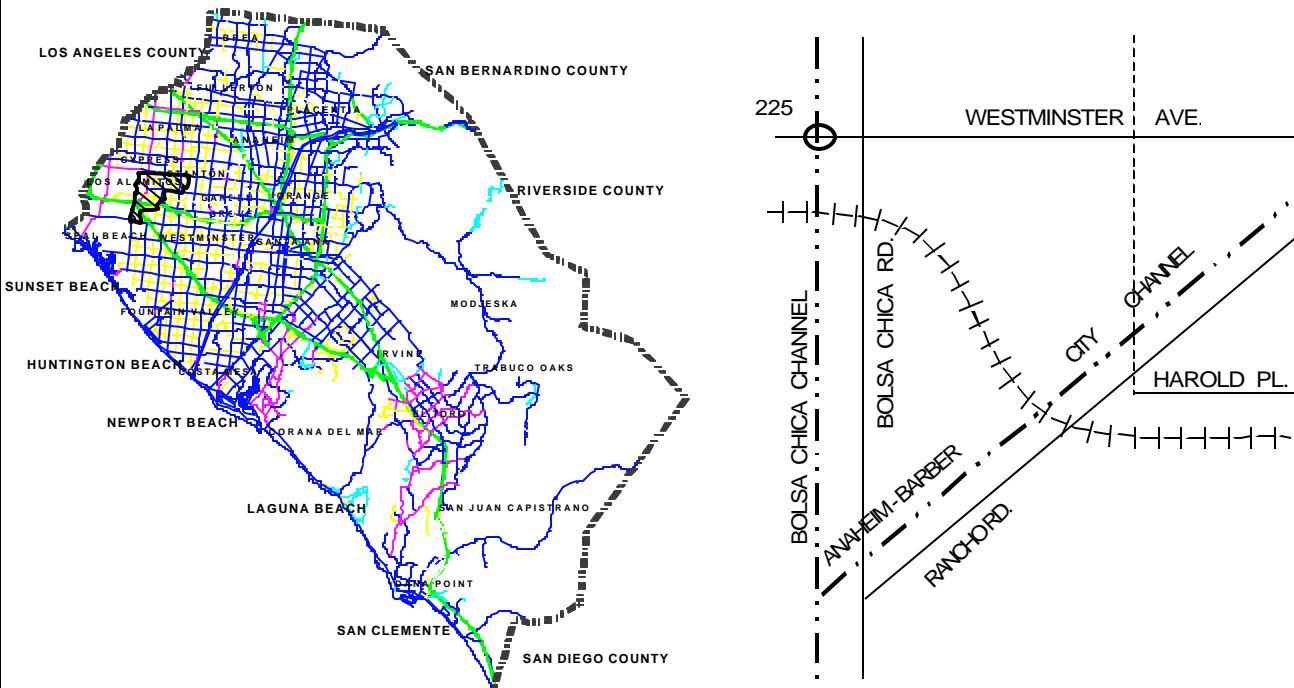
WTR YEAR 2002: TOTAL 2,057.6 MEAN 5.6 MAX 69.0 MIN 1.1 AC-FT 4,079

- Dewatering activities upstream

Peak Discharge = 594 cfs on November 24, 2001

Figure 20

## BOLSA CHICA CHANNEL AT WESTMINSTER STATION NO. 225



<b>LOCATION:</b>	Latitude $33^{\circ} 45' 33''$ , Longitude $118^{\circ} 02' 30''$ . Beneath Westminster Ave.
<b>DRAINAGE AREA:</b>	10.0 sq. mi. ( $26.0 \text{ km}^2$ )
<b>GAGE ELEVATION:</b>	5.0 ft. (1.50 m) MSL
<b>HYDRAULIC CONTROL:</b>	Subcritical flow - trapezoidal, rip rap/earthen channel and tidal backwater.
<b>EQUIPMENT:</b>	Stevens A-71 water-stage recorder with float and ALERT water level sensor.
<b>PERIOD OF RECORD:</b>	January 1976 to August 1985 @ Bolsa Avenue September 1985 to present at Westminster Ave.
<b>REMARKS:</b>	Due to a slight slope of the channel, tidal effects namely from high tides are of concern.
<b>ACCURACY:</b>	Fair

Table 35

**BOLSA CHICA CHANNEL AT WESTMINSTER BLVD.**

Station 225

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
 WATER YEAR JUL 2001 TO JUN 2002

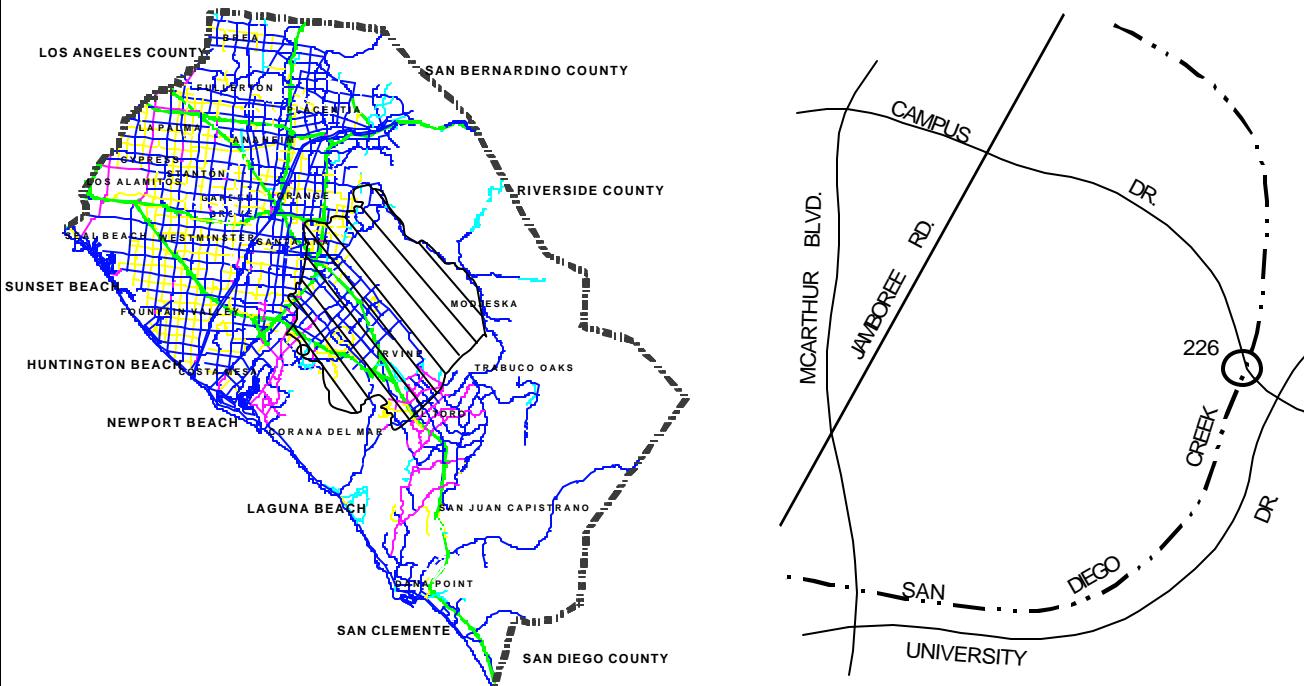
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.90	1.2	2.0	.78	1.7	.62	.76	.94	.80	.76	.42	1.5
2	.77	1.2	1.8	.84	1.7	.75	.68	1.0	.81	1.6	.40	1.8
3	.78	1.2	2.2	.80	2.0	56	2.0	1.3	.78	2.6	.38	1.5
4	.79	1.2	1.8	.91	4.4	.61	.65	1.0	.82	5.6	.35	1.8
5	.80	1.3	1.2	2.2	8.0	.54	.49	1.2	.83	5.8	.34	1.1
6	.82	1.1	1.4	2.2	1.2	2.0	.47	1.2	.71	6.3	.46	.96
7	.83	1.1	1.4	2.4	.96	.52	.47	1.2	3.7	2.8	.42	.87
8	.84	.96	1.2	2.1	1.0	.80	1.2	.95	.69	2.7	.80	.81
9	.85	1.1	1.5	.93	.65	.93	.69	1.1	.64	1.3	.92	.76
10	.86	1.0	1.2	.77	.80	.80	.65	.87	.61	.68	.91	.59
11	.87	1.1	1.1	.76	.87	.57	.60	.88	.58	1.0	.96	.69
12	.89	1.3	1.2	.60	.64	.62	.64	.97	.65	1.0	1.4	.36
13	.90	1.4	1.1	.61	28	.94	.73	.84	.76	1.2	1.8	.38
14	.91	1.1	1.2	.56	1.5	19	.78	.69	.59	1.4	4.4	.41
15	.92	.90	1.1	.56	1.6	2.6	.71	.58	.61	13	1.8	.41
16	.93	.78	1.3	.65	2.1	.62	.76	.54	.66	1.3	2.2	.49
17	.94	.57	1.2	.75	1.1	.58	.64	31	1.8	.91	2.1	.58
18	.96	.52	1.2	1.6	1.1	.62	.82	1.1	6.3	.75	1.8	3.4
19	.98	.66	1.1	1.2	1.3	.57	.91	.54	.76	.61	1.8	.50
20	.99	.62	1.1	.83	1.4	.50	.77	.69	.77	.52	11	.52
21	1.0	.66	1.2	.74	1.5	52	.95	.52	.78	.50	.91	.89
22	1.0	.56	1.2	.78	1.7	1.3	.94	.52	.65	.49	.91	1.2
23	1.0	.72	.96	1.0	2.0	.64	1.2	.64	12	.48	1.1	1.7
24	1.0	.82	2.3	.78	173	.71	1.6	.55	1.4	8.2	1.2	1.5
25	1.1	1.0	.99	.81	8.2	.58	.88	.70	.96	.60	1.1	1.1
26	1.1	1.1	.86	.82	3.2	.64	.92	.57	.78	.48	1.2	1.1
27	1.1	1.3	.85	.99	2.5	.72	2.2	.69	.71	.44	1.1	2.0
28	1.2	1.3	.81	.85	2.9	.61	52	.75	.60	.36	.86	1.4
29	1.1	1.2	1.0	1.3	47	54	13	-----	.74	.41	.82	.92
30	1.1	1.3	.91	1.5	1.5	29	1.0	-----	.63	.31	1.1	1.7
31	1.1	1.4	-----	1.3	-----	5.3	.96	-----	.61	-----	.92	-----
TOTAL	29.33	31.67	38.38	32.92	305.52	235.69	91.07	53.53	43.73	64.10	45.88	32.94
MEAN	.95	1.02	1.28	1.06	10.2	7.60	2.94	1.91	1.41	2.14	1.48	1.10
MAX	1.2	1.4	2.3	2.4	173	56	52	31	12	13	11	3.4
MIN	.77	.52	.81	.56	.64	.50	.47	.52	.58	.31	.34	.36
AC-FT	58	63	76	65	606	467	181	106	87	127	91	65

WTR YEAR 2002: TOTAL 1,004.76 MEAN 2.75 MAX 173 MIN .31 AC-FT 1,990

Peak Discharge = 1.440 cfs on November 24, 2001

Figure 21

## SAN DIEGO CREEK AT CAMPUS STATION NO. 226



<b>LOCATION:</b>	Latitude $33^{\circ} 39' 20''$ , Longitude $117^{\circ} 50' 41''$ . On the right bank downstream of Campus Drive.
<b>DRAINAGE AREA:</b>	111 sq. mi (287.5 km <sup>2</sup> ).
<b>GAGE ELEVATION:</b>	45.0 ft. (13.7 m) MSL.
<b>HYDRAULIC CONTROL:</b>	Downstream critical depth control and subcritical flow - trapezoidal, earthen channel.
<b>EQUIPMENT:</b>	Stevens A-71 water-stage recorder with Balanced Beam Manometer, ALERT rain gage and water level sensor.
<b>PERIOD OF RECORD:</b>	August 1977 to present. Prior to 1986 the station was operated by USGS.
<b>REMARKS:</b>	Discharge data required for sediment TMDL compliance program.
<b>RATING CURVE ACCURACY:</b>	Good

Table 36

**SAN DIEGO CREEK AT CAMPUS DRIVE**

Station 226

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	8.1	9.7	12	12	7.5	5.4	14	11	12	9.3	8.6	6.7
2	8.7	11	11	12	6.9	4.7	11	9.6	11	8.9	9.8	6.7
3	7.7	9.8	11	13	5.8	39	9.2	7.5	9.6	8.8	7.3	10
4	11	10	11	14	13	13	9.1	5.1	11	6.5	7.5	8.6
5	9.7	11	11	9.9	14	7.2	5.5	6.2	11	6.1	7.3	7.7
6	15	11	11	10	9.5	7.0	5.5	7.8	10	22	7.9	7.1
7	12	12	11	8.8	8.0	6.6	4.8	8.7	97	11	7.3	7.9
8	10	13	9.4	6.9	8.4	7.8	5.8	8.3	22	8.9	6.0	7.1
9	9.6	13	12	7.0	6.6	7.4	5.8	8.1	8.5	9.5	5.5	7.7
10	6.7	9.2	13	6.6	7.4	22	5.3	7.4	7.8	9.4	6.7	6.4
11	12	13	15	6.0	10	26	4.8	9.2	7.4	10	6.6	6.4
12	13	14	14	6.8	138	9.1	5.0	11	7.5	11	6.5	6.8
13	16	12	14	12	85	7.2	5.0	11	7.4	12	6.5	7.3
14	9.8	11	16	14	15	90	5.5	12	7.0	11	5.7	7.4
15	8.3	11	14	12	13	34	6.4	14	6.6	19	7.0	6.8
16	9.4	11	12	10	8.3	11	6.9	13	6.7	23	6.0	5.8
17	11	11	13	9.8	8.0	11	13	89	12	14	5.5	6.0
18	11	9.9	11	9.4	8.1	13	6.3	34	69	13	6.5	8.1
19	11	10	16	8.9	7.9	11	4.9	12	9.9	12	9.8	7.3
20	11	11	10	9.6	7.2	9.0	4.7	13	8.1	11	8.6	8.0
21	11	11	9.9	10	4.7	202	4.2	11	11	11	7.2	6.5
22	11	11	12	9.3	4.3	35	4.5	12	8.7	11	5.8	6.7
23	12	10	11	11	4.5	16	4.7	13	26	10	6.5	7.5
24	11	11	13	17	312	11	4.2	14	12	23	6.8	7.9
25	12	11	11	18	58	11	3.9	13	9.5	27	6.8	7.8
26	12	10	9.0	11	11	12	3.9	13	8.7	31	6.9	7.2
27	12	11	6.3	7.4	7.5	13	36	13	8.1	18	7.0	9.9
28	12	13	9.2	5.6	5.7	10	314	13	8.4	11	6.8	6.6
29	11	12	11	8.3	63	62	21	-----	8.6	11	6.9	6.9
30	11	11	12	5.4	19	97	13	-----	8.7	9.2	7.1	5.6
31	11	12	-----	7.0	-----	61	14	-----	8.9	-----	6.5	-----
TOTAL	337.0	346.6	351.8	308.7	877.3	871.4	561.9	399.9	460.1	398.6	216.9	218.4
MEAN	10.9	11.2	11.7	9.96	29.2	28.1	18.1	14.3	14.8	13.3	7.00	7.28
MAX	16	14	16	18	312	202	314	89	97	31	9.8	10
MIN	6.7	9.2	6.3	5.4	4.3	4.7	3.9	5.1	6.6	6.1	5.5	5.6
AC-FT	668	687	698	612	1,740	1,730	1,110	793	913	791	430	433

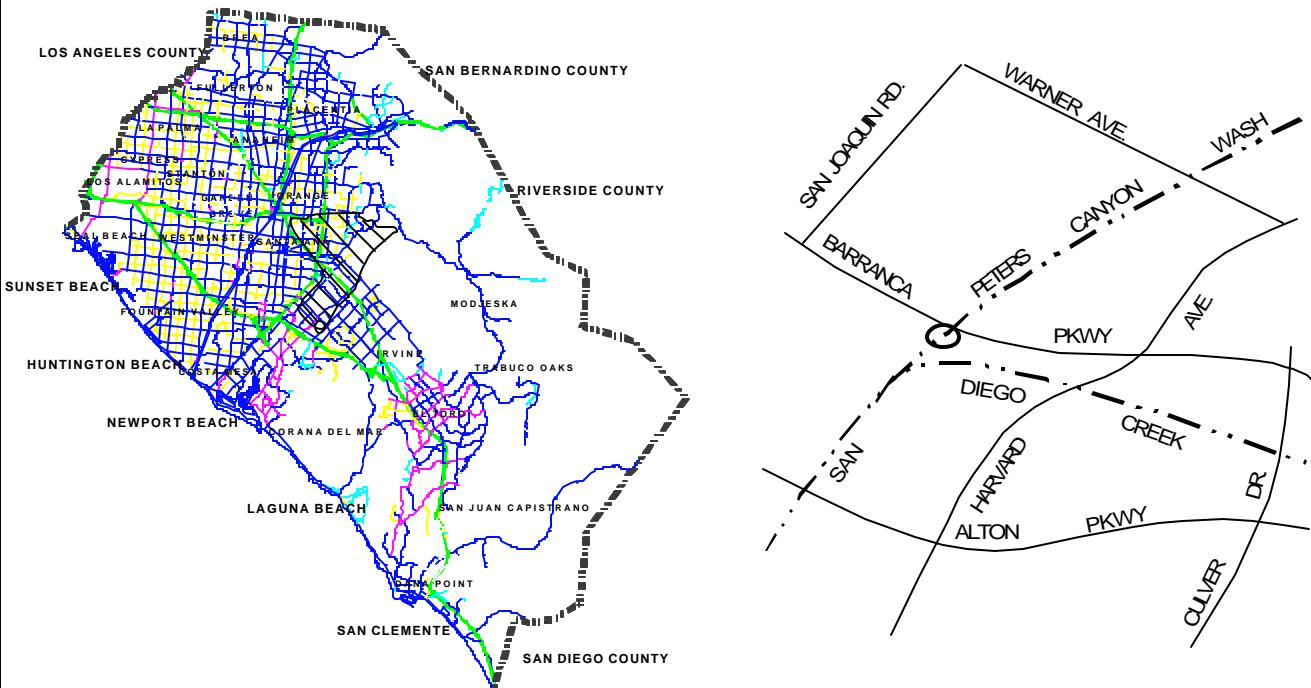
WTR YEAR 2002: TOTAL 5,348.6 MEAN 14.7 MAX 314 MIN 3.9 AC-FT 10,610

Peak Discharge = 1,760 cfs on November 24, 2001

Figure 22

# PETERS CANYON WASH AT BARRANCA

## STATION NO. 230



**LOCATION:** Latitude  $33^{\circ} 41' 29''$ , Longitude  $117^{\circ} 49' 23''$ . On the right bank approximately 60.0 ft. downstream of Barranca Parkway Bridge.

**DRAINAGE AREA:** 45.2 sq. mi. (117 km<sup>2</sup>)

**GAGE ELEVATION:** 45.0 ft. (13.7 m) MSL

**HYDRAULIC CONTROL:** Subcritical flow - shifting low flow vegetation and confluence backwater.

**EQUIPMENT:** Stevens A-71 water-stage recorder with Balanced Beam ALERT rain gage and water level sensor.

**PERIOD OF RECORD:** July 1985 to present

**REMARKS:** Low flow augmented by irrigation return. - Discharge data required for sediment TMDL compliance program.

## RATING CURVE ACCURACY:

Table 37

**PETERS CANYON WASH AT BARRANCA PARKWAY**

Station 230

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

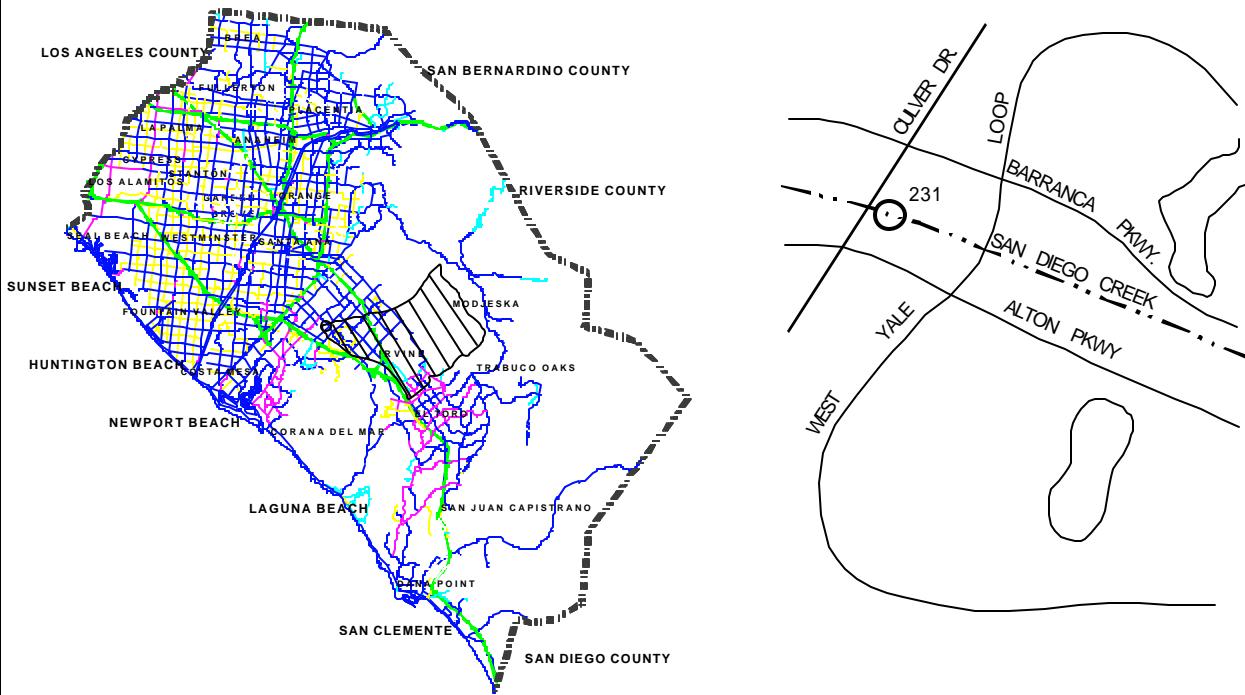
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	8.3	7.7	7.5	7.7	6.4	6.6	6.0	7.3	7.2	5.7	4.3	4.8
2	8.3	7.7	7.3	8.0	6.6	6.5	5.8	6.3	6.9	6.0	4.4	4.8
3	7.5	7.7	7.5	7.8	6.4	15.2	6.6	5.5	6.9	6.0	4.3	4.7
4	7.8	7.5	8.0	7.5	8.2	6.5	5.8	5.1	7.2	6.2	4.7	7.2
5	7.7	7.3	8.0	7.8	6.4	5.7	5.3	4.7	6.7	6.3	5.2	5.1
6	7.5	7.6	7.8	7.8	5.4	5.6	5.1	6.8	8.2	13.6	5.6	4.8
7	8.0	7.7	7.5	7.2	5.4	6.2	4.6	7.4	23.1	6.3	5.8	4.8
8	8.8	7.8	7.3	7.3	5.5	6.7	4.2	7.3	9.7	6.1	5.9	4.8
9	9.6	7.7	7.2	7.8	5.6	5.9	4.2	5.7	7.4	5.9	6.1	4.7
10	9.4	7.2	7.2	7.8	5.7	5.9	4.4	5.9	7.1	5.7	6.2	4.5
11	9.3	6.9	8.6	7.5	5.6	5.9	4.9	6.8	6.9	5.8	6.3	4.5
12	8.7	6.8	8.2	8.0	72.2	6.0	5.1	7.4	6.8	5.9	6.4	5.1
13	8.4	6.9	8.0	9.4	19.3	6.3	5.1	7.2	7.5	5.5	6.8	5.1
14	8.2	6.7	8.0	9.0	7.0	25.6	5.1	6.9	7.4	9.6	6.8	5.4
15	7.8	6.9	8.3	8.0	6.0	6.9	4.9	7.5	7.2	21.4	6.7	5.3
16	7.7	6.9	7.7	7.8	5.3	6.4	5.5	8.1	7.2	16.3	6.5	5.1
17	7.5	6.9	7.2	7.6	5.1	6.9	5.6	33.2	16.0	7.1	6.4	5.1
18	7.6	6.9	7.2	7.2	6.7	7.2	5.3	7.6	12.2	6.9E	6.1	5.1
19	7.7	7.0	7.2	7.2	6.4	7.5	5.2	6.6	7.4	6.7E	8.8	5.4
20	7.1	6.9	6.9	6.5	6.7	8.0	5.1	7.2	7.1	6.0E	6.2	5.4
21	6.8	6.9	6.7	6.4	6.5	55.7	5.1	7.5	6.9	5.9E	5.8	5.3
22	6.7	7.2	6.7	6.9	6.9	9.7	5.5	7.5	6.9	5.9E	5.6	5.1
23	6.5	7.4	6.7	6.9	6.9	7.1	5.5	7.1	10.8	5.2E	5.1	5.9
24	6.5	7.6	6.4	6.7	69.8	6.9	5.3	7.5	6.8	12.8E	5.4	5.9
25	6.7	8.0	6.2	6.7	8.6	7.1	5.4	7.8	6.2	7.8	5.6	6.2
26	6.9	8.2	6.4	6.7	5.7	7.2	5.5	7.8	6.2	10.6	5.6	5.6
27	6.9	8.3	6.4	6.7	5.7	7.1	14.9	7.5	6.2	5.6	5.7	6.9
28	7.2	8.0	6.2	6.7	6.1	6.7	126	7.8	6.1	4.1	5.9	5.4
29	7.0	8.0	6.2	6.2	24.5	27.3	8.6	-----	5.9	4.5	5.6	5.4
30	7.4	7.8	6.9	6.0	7.0	24.7	7.5	-----	5.7	4.1	5.6	5.4
31	7.3	7.8	-----	5.9	-----	9.8	7.9	-----	5.6	-----	5.6	-----
TOTAL	238.8	229.9	217.4	226.7	349.6	326.8	301.0	221.0	249.4	225.5	181.0	158.8
MEAN	7.7	7.4	7.2	7.3	11.7	10.5	9.7	7.9	8.0	7.5	5.8	5.3
MAX	9.6	8.3	8.6	9.4	72.2	55.7	126	33.2	23.1	21.4	8.8	7.2
MIN	6.5	6.7	6.2	5.9	5.1	5.6	4.2	4.7	5.6	4.1	4.3	4.5
AC-FT	474	456	431	450	693	648	597	438	495	447	359	315

WTR YEAR 2002: TOTAL 2,925.9 MEAN 8.0 MAX 126 MIN 4.1 AC-FT 5,803

Peak Discharge = 1,390 cfs on November 21, 2001

Figure 23

## SAN DIEGO CREEK AT CULVER STATION NO. 231



<b>LOCATION:</b>	Latitude $33^{\circ} 40' 54''$ , Longitude $117^{\circ} 48' 31''$ . Approximately 150 ft upstream of the Culver Drive bridge on the right bank and 200 feet from the drop structure and energy dissipater.
<b>DRAINAGE AREA:</b>	41.8 sq. mi. ( $108 \text{ km}^2$ )
<b>GAGE ELEVATION:</b>	75.0 ft. (22.9 m) MSL
<b>HYDRAULIC CONTROL:</b>	Subcritical flow - shifting low flow vegetation and confluence backwater.
<b>EQUIPMENT:</b>	Stevens A-71 water-stage recorder with Pressure Transducer and Balanced Beam Manometer. ALERT Rain gauge and water level sensor.
<b>PERIOD OF RECORD:</b>	January 1965 to present
<b>REMARKS:</b>	USGS operated prior to 1986. - Discharge data required for sediment TMDL compliance program.
<b>RATING CURVE ACCURACY:</b>	Good

Table 38

**SAN DIEGO CREEK AT CULVER DRIVE**

Station 231

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

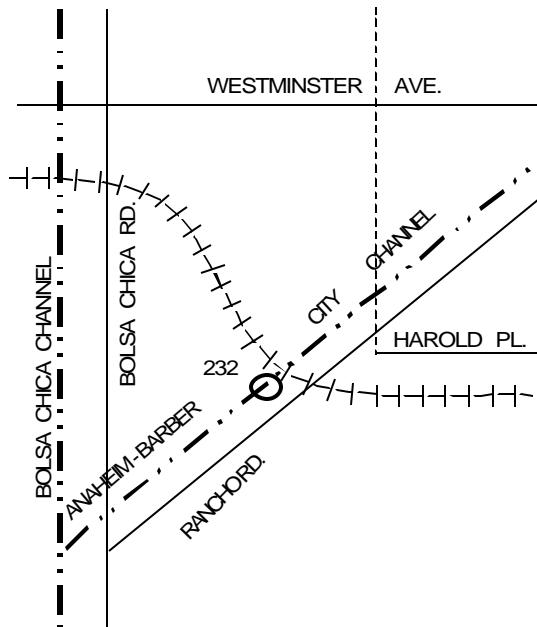
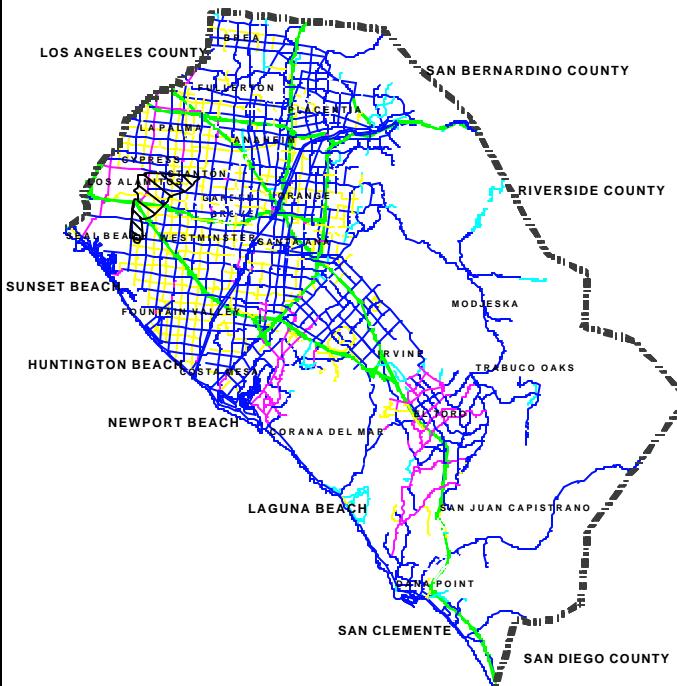
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	2.0	1.1	1.1	.88	.84	5.0	2.3	1.8	1.1	2.2	.65	.66
2	1.6	.85	1.1	.86	1.2	2.1	1.9	1.6	1.1	2.2	.71	.67
3	1.6	.83	1.2	.84	.87	20	1.7	1.4	1.1	2.2	.71	.66
4	1.6	.83	1.2	.98	1.5	4.2	1.4	1.3	1.2	2.6	.79	.66
5	3.4	1.1	1.3	1.2	1.7	2.5	1.3	1.3	1.2	2.6	.97	.62
6	1.6	1.2	1.4	1.3	.80	2.4	1.2	1.3	.79	3.7	1.1	.58
7	1.6	1.5	1.6	1.3	.84	2.6	1.1	1.3	10	2.4	1.1	.58
8	1.3	1.5	1.6	1.1	.71	2.5	1.1	1.5	1.7	1.2	1.3	.62
9	1.5	1.5	1.8	1.3	.66	2.5	1.2	1.6	.70	1.1	1.3	.66
10	1.6	1.5	1.9	1.4	.72	12	1.2	1.4	.75	.90	1.3	.66
11	1.5	.75	2.0	1.4	1.4	7.7	1.3	1.3	.75	.83	1.3	.66
12	1.3	.75	1.9	1.7	56	2.4	1.3	1.2	.79	.79	1.3	.71
13	1.3	.83	1.8	2.0	84	2.2	1.3	1.1	.78	.75	1.3	.66
14	1.3	1.2	1.8	1.9	2.5	24	1.5	1.1	.75	.74	1.2	.66
15	1.2	2.0	1.7	1.3	1.2	9.0	1.5	1.1	.79	2.9	.94	.77
16	1.2	2.0	1.5	1.0	.67	2.3	1.5	1.2	.79	1.3	.94	.79
17	1.1	2.0	1.1	1.5	.66	1.9	1.5	30	2.3	.71	1.1	.75
18	1.2	2.0	1.0	1.2	.73	1.9	1.5	3.6	24	.79	.83	.71
19	1.2	2.0	1.1	1.5	.77	1.8	1.6	1.6	1.5	.71	1.1	.83
20	1.1	2.1	.93	1.3	.83	1.6	1.6	1.3	.94	.71	1.2	.83
21	1.3	1.6	.96	1.3	1.0	98	1.6	1.2	.81	.73	1.1	.87
22	1.5	1.2	1.4	1.2	1.1	15	1.6	1.2	.83	.79	.83	1.1
23	1.2	1.1	.66	1.1	1.2	3.9	1.5	1.2	5.8	.94	.75	.94
24	1.2	1.2	.75	1.1	130	2.2	1.6	1.2	2.5	9.2	.74	.83
25	.83	1.2	1.0	.85	17	2.1	1.6	1.3	1.9	3.1	.71	.83
26	.75	1.1	.82	.79	2.0	1.8	1.6	1.2	1.8	2.5	.71	.79
27	.75	1.1	.75	.90	1.5	2.0	2.3	1.2	1.9	1.3	.71	.79
28	.83	1.1	.75	1.0	1.7	2.0	109	1.2	2.0	.76	.69	.94
29	.83	1.1	.90	.79	68 E	30 E	5.4	-----	1.8	.77	.71	.94
30	.94	.94	1.0	.92	4.5	62 E	2.3	-----	2.0	.71	.71	1.1
31	.94	.95	-----	.88	-----	45 E	2.1	-----	2.0	-----	.75	-----
TOTAL	41.27	40.13	38.02	36.79	386.60	374.6	159.6	67.7	76.37	52.13	29.55	22.87
MEAN	1.33	1.29	1.27	1.19	12.9	12.1	5.15	2.42	2.46	1.74	.95	.76
MAX	3.4	2.1	2.0	2.0	130	98	109	30	24	9.2	1.3	1.1
MIN	.75	.75	.66	.79	.66	1.6	1.1	1.1	.70	.71	.65	.58
AC-FT	82	80	75	73	767	743	317	134	151	103	59	45

WTR YEAR 2002: TOTAL 1,325.63 MEAN 3.63 MAX 130 MIN .58 AC-FT 2,630

Peak Discharge = 880 cfs on November 12, 2001

Figure 24

**ANAHEIM - BARBER CITY AT RANCHO**  
STATION NO. 232



**LOCATION:** Latitude  $33^{\circ} 45' 16''$ , longitude  $118^{\circ} 02' 04''$ . Approximately 20 ft. downstream of U.S Government railroad bridge on right bank.

**DRAINAGE AREA:** 14.9 sq. mi. ( $38.6 \text{ km}^2$ )

**GAGE ELEVATION:** 5.0 FT. (1.52 m) MSL

**HYDRAULIC CONTROL:** Subcritical flow - trapezoidal earthen channel and tidal backwater effect.

**EQUIPMENT:** Stevens A-71 water-stage recorder with nitrogen bubbler and mercury manometer ALERT water level sensor and rain gage.

**PERIOD OF RECORD:** January 1986 to present

**REMARKS:** Velocities may be affected by backwater from Bolsa Chica Channel approximately 1/2 mile downstream.

**ACCURACY:** Good

Table 39

**ANAHEIM-BARBER CITY CHANNEL AT RANCHO**

Station 232

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

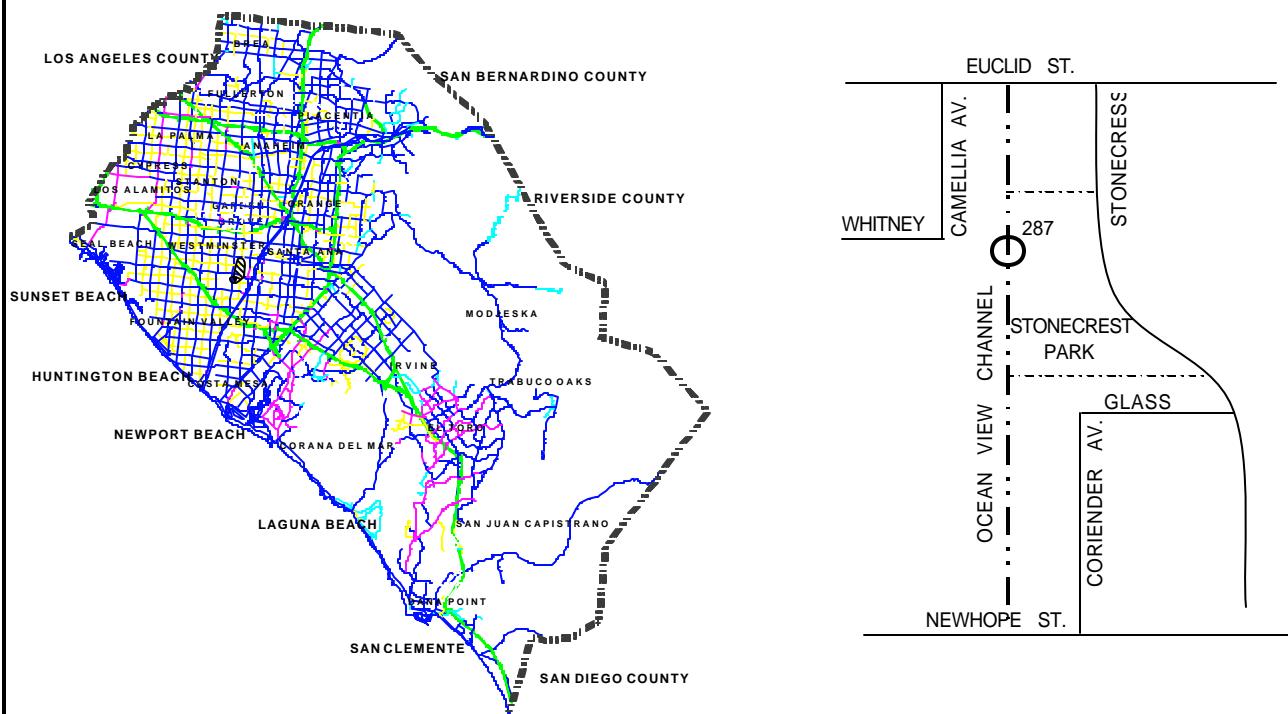
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	1.2	1.7	.87	.48	1.2	.67	.61	.56	.61	1.1	.69	.73
2	1.2	2.3	1.4	.43	.95	.58	.74	.60	.58	.91	.54	.73
3	1.2	1.5	1.5	.47	.74	40	1.4	.54	.58	1.5	.80	.73
4	1.2	1.5	1.4	.73	1.1	2.0	.70	.59	.58	.94	.58	.73
5	1.2	2.3	2.1	.73	1.2	.83	.67	.66	.58	.90	.62	.67
6	2.0	1.9	1.4	.87	.96	.90	.70	.83	.65	2.1	.67	.80
7	2.3	1.3	1.3	.80	1.2	1.6	.95	.76	4.4	.81	.73	.67
8	2.1	3.0	1.3	.87	.85	1.1	.86	.91	.69	1.1	.67	.73
9	1.2	2.2	1.3	.80	1.1	1.3	.98	.64	.67	.81	.62	.73
10	.88	1.0	1.9	.74	.76	.94	.75	.72	.77	.75	.82	.67
11	1.8	.90	2.1	.71	3.9	.68	1.1	1.2	.82	.86	.77	.73
12	1.6	.99	2.2	.70	133	.54	.77	.88	.68	.86	.79	.80
13	.98	.91	2.1	.76	6.9	.72	.81	.90	.74	.77	.82	.87
14	1.2	.99	2.3	.87	.76	15	.74	.65	.70	.79	.76	.87
15	1.7	2.1	3.3	1.8	.67	.90	.59	.68	.89	10	.77	.95
16	1.6	1.4	2.8	.89	.69	.76	.61	.72	.51	1.3	.78	1.0
17	1.0	1.0	2.8	.70	.79	.65	.57	28	4.4	.73	.90	1.1
18	2.6	1.2	1.8	.76	.85	.98	.64	1.3	5.0	.66	1.1	1.1
19	2.3	.96	.74	.80	.87	.93	.59	1.1	.87	.74	1.3	1.1
20	1.4	1.3	.73	.74	.78	.59	.62	.67	.85	.69	16	1.1
21	1.2	1.2	.76	.92	1.1	44	.59	.63	.83	.79	.84	1.1
22	2.6	1.2	.81	1.2	.78	.71	.64	.58	.85	.78	.86	1.1
23	1.9	1.1	.56	1.2	.77	.52	.68	.64	8.8	.78	.77	1.1
24	1.2	.62	.46	1.5	208	.57	.83	.58	.82	7.9	.71	1.1
25	2.2	.75	.43	1.6	2.7	.56	.85	.59	1.0	.62	1.1	
26	2.1	1.5	.38	2.1	2.3	.47	.65	.48	.73	8.3	.67	1.1
27	1.5	1.2	.32	1.8	2.0	.43	13	.50	.64	.81	.67	1.1
28	1.0	.87	.35	1.9	1.5	.85	33	.90	1.0	.62	.67	1.1
29	1.6	1.7	.41	1.8	29	34	2.3	-----	.74	.71	.67	1.1
30	1.7	2.0	.38	1.8	.91	16	.57	-----	.92	.73	.67	1.1
31	1.7	1.2	-----	1.7	-----	1.3	.52	-----	1.2	-----	.67	-----
TOTAL	49.36	43.79	40.20	33.17	408.33	171.08	69.03	47.81	42.69	50.74	38.55	27.81
MEAN	1.59	1.41	1.34	1.07	13.6	5.52	2.23	1.71	1.38	1.69	1.24	.93
MAX	2.6	3.0	3.3	2.1	208	44	33	28	8.8	10	16	1.1
MIN	.88	.62	.32	.43	.67	.43	.52	.48	.51	.62	.54	.67
AC-FT	98	87	80	66	810	339	137	95	85	101	76	55

WTR YEAR 2002: TOTAL 1,022.56 MEAN 2.80 MAX 208 MIN .32 AC-FT 2,030

Peak Discharge = 1,820 cfs on November 24, 2001

Figure 25

## OCEANVIEW CHANNEL AT STONECRESS PARK STATION NO. 287



**LOCATION:** Latitude  $33^{\circ} 43' 12''$ , Longitude  $117^{\circ} 55' 54''$ . On the left bank at footbridge approximately 300 feet upstream of Euclid St.

**DRAINAGE AREA:** 2.0 sq. nii. ( $5.2 \text{ km}^2$ )

**GAGE ELEVATION:** 48 ft. (14.6 in) MSL

**HYDRAULIC CONTROL:** Super critical flow-trapezoidal, rip rap with earthen bottom.

**EQUIPMENT:** Stevens A-71 water stage recorder with float, Alert raingage and water level sensor

**PERIOD OF RECORDS:** July 1996 to present.

**REMARKS:** No regulation or diversion above gage.

**RATING CURVE  
ACCURACY:** Good

Table 40

**OCEANVIEW CHANNEL AT STONECRESS PARK**

Station 287

PUBLIC FACILITIES AND RESOURCES DEPARTMENT

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

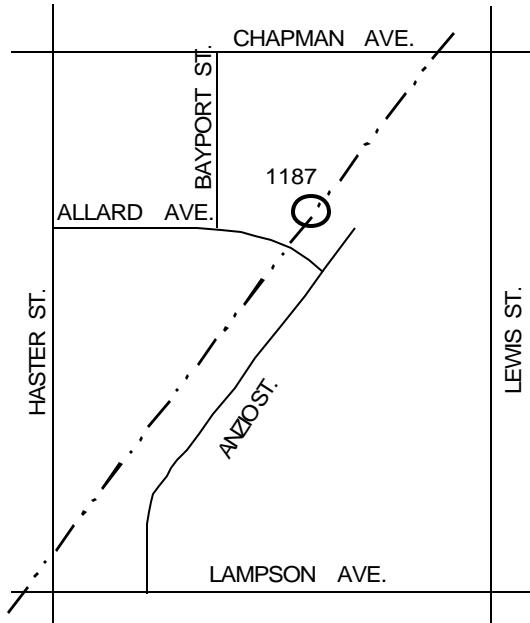
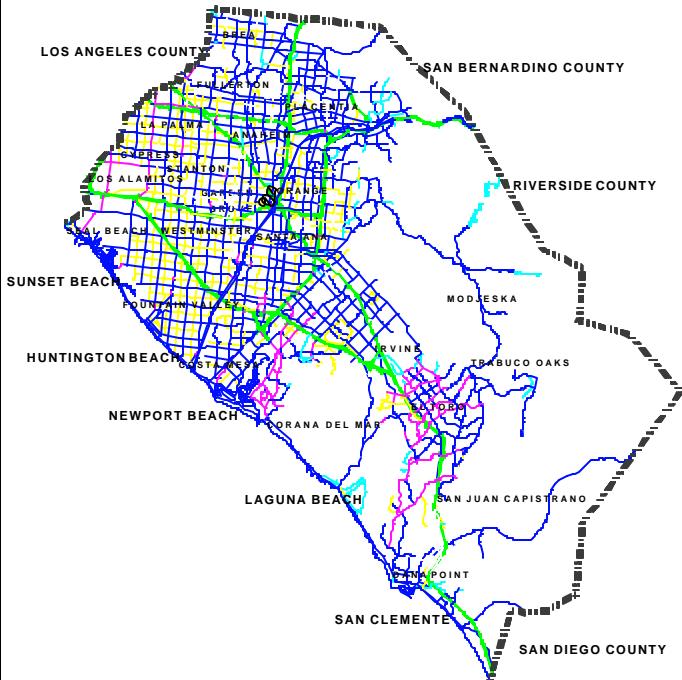
Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.1	.1	.1	.1	.1	.1	.1	.1	.2	.1	.3	.1
2	.1	.1	.1	.1	.1	.1	.1	.1	.2	.1	.1	.1
3	.1	.1	.1	.2	.1	3.9	.2	.1	.2	.1	.2	.1
4	.1	.1	.1	.2	.2	.1	.1	.1	.2	.1	.1	.1
5	.1	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1	.2
6	.1	.2	.1	.2	.1	.1	.1	.2	1.0	.2	.1	.2
7	.1	.2	.1	.2	.1	.1	.1	.1	3.0	.1	.1	.2
8	.1	.2	.1	.2	.1	.1	.1	.2	.2	.1	.1	.2
9	.1	.2	.1	.2	.1	.1	.1	.1	.2	.2	.1	.2
10	.1	.2	.1	.2	.1	.1	.1	.2	.2	.2	.1	.2
11	.2	.2	.2	.2	.1	.1	.1	.2	.1	.2	.1	.2
12	.1	.2	.1	.2	11.1	.1	.1	.3	.1	.3	.1	.2
13	.1	.2	.2	.2	.1	.1	.1	.3	.1	.3	.2	.2
14	.1	.2	.2	.2	0	.5	.1	.4	.1	.4	.2	.2
15	.1	.2	.2	.2	0	.1	.1	.5	.1	1.0	.2	.2
16	.2	.2	.2	.2	.1	.1	.1	.4	.1	.4	.2	.2
17	.2	.2	.2	.1	.1	.1	.1	7.2	3.1	.5	.2	.2
18	.2	.1	.2	.1	.1	.1	.1	.1	.2	.4	.2	.2
19	.2	.2	.1	.1	.1	.1	.1	.1	.1	.3	.2	.2
20	.2	.2	.2	.1	.1	.2	.1	.2	.1	.4	7.1	.2
21	.2	.1	.2	.1	0	14.9	.1	.2	.1	.4	.2	.2
22	.2	.1	.2	.1	0	.1	.1	.2	.6	.3	.2	.2
23	.1	.1	.2	.1	0	.1	.1	.2	1.9	.3	.2	.3
24	.2	.1	.1	.1	14.3	.1	.1	.2	.1	1.1	.2	.3
25	.2	.1	.2	.1	0	.1	.1	.2	.1	.5	.1	.3
26	.2	.1	.2	.1	0	.1	.1	.2	.1	1.3	.2	.3
27	.2	.1	.2	.1	0	.1	7.8	.2	.1	.4	.2	.3
28	.2	.1	.2	.1	0	.1	3.5	.2	.1	.4	.2	.3
29	.1	.1	.2	.1	8.1	8.2	.4	-----	.1	.4	.1	.5
30	.2	.1	.1	.1	.1	6.0	.1	-----	.1	.4	.1	.3
31	.2	.1	-----	.1	-----	.2	.1	-----	.1	-----	.1	-----
TOTAL	4.6	4.6	4.7	4.5	35.4	36.3	14.6	12.6	13.0	11.0	11.8	6.6
MEAN	.1	.1	.2	.1	1.2	1.2	.5	.5	.4	.4	.4	.2
MAX	.2	.2	.2	.2	14.3	14.9	7.8	7.2	3.1	1.3	7.1	.5
MIN	.1	.1	.1	.1	0	.1	.1	.1	.1	.1	.1	.1
AC-FT	9.1	9.1	9.3	8.9	70.2	72.0	29.0	25.0	25.8	21.8	23.4	13.1

WTR YEAR 2002: TOTAL 159.7 MEAN .43 MAX 14.9 MIN 0 AC-FT 317

Peak Discharge = 225 cfs on November 24, 2001

Figure 26

## UPPER EAST GARDEN GROVE WINTERSBURG STATION NO. 1187



**LOCATION:** Latitude  $33^{\circ} 47' 10''$ , Longitude  $117^{\circ} 54' 03''$ . On the right bank approximately 100 feet upstream of Allard Avenue.

**DRAINAGE AREA:** 1.6 sq. M. (4.2 km<sup>2</sup>)

**GAGE ELEVATION:** 121 ft. (36.9 in.) MSL

**HYDRAULIC CONTROL:** Supercritical flow - concrete lined, trapezoidal channel.

**EQUIPMENT:** Stevens A-71 water stage recorder with Balanced Beam Manometer and ALERT rain gage and water level sensor.

**PERIOD OF RECORD:** July 1995 to present.

**REMARKS:** No regulation or diversion above gage.

**RATING CURVE**

**ACCURACY:** Fair

Table 41

**UPPER EAST GARDEN GROVE WINTERSBURG**

Station 1187

DEPARTMENT PUBLIC FACILITIES AND RESOURCES

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.12	.03	.04	.05	.05	0	0	0	0	.01	.02	.03
2	.12	.02	.04	.05	.06	0	0	0	.01	.01	.02	.02
3	.12	.02	.04	.05	.07	1.5	.01	0	0	0	.02	.02
4	.12	.02	.04	.05	.14	.01	0	0	.01	0	.02	.02
5	.14	.02	.04	.05	.08	.01	0	.01	.01	.01	.02	.02
6	.06	.02	.04	.05	.07	0	0	.01	0	.05	.03	.02
7	.06	.02	.04	.05	.05	.01	0	0	.23	.02	.03	.02
8	.08	.02	.04	.05	.06	.01	0	.01	0	.01	.02	.02
9	.08	.02	.04	.05	.05	.01	0	.01	.01	.02	.02	.02
10	.07	.02	.04	.05	.05	.01	0	.01	0	.02	.03	.03
11	.07	.02	.04	.05	.13	0	0	.01	0	.02	.03	.03
12	.07	.03	.04	.06	3.0	0	0	.01	0	.02	.02	.03
13	.07	.03	.03	.06	.05	0	0	.01	0	.02	.06	.03
14	.07	.03	.03	.06	.02	1.0	0	.01	.01	.02	.02	.02
15	.06	.03	.03	.06	.02	.01	0	.01	.02	.54	.02	.02
16	.06	.03	.03	.06	.04	0	.01	.01	.02	.03	.02	.02
17	.06	.03	.03	.06	.02	0	0	.68	.20	.02	.04	.02
18	.06	.03	.03	.06	.02	0	0	.01	.03	.03	.02	.03
19	.06	.03	.03	.06	.02	0	0	.01	.01	.02	.04	.03
20	.05	.03	.03	.06	.03	0	0	0	.01	.02	1.2	.05
21	.04	.03	.03	.06	.04	2.5	0	0	0	.03	.06	.06
22	.04	.03	.03	.07	.03	0	0	0	.01	.03	.05	.06
23	.04	.03	.03	.07	.03	0	0	0	.21	.03	.05	.06
24	.04	.03	.03	.07	.07	5.1	0	0	.02	.26	.04	.06
25	.04	.03	.03	.07	.07	0	0	0	.01	.02	.03	.06
26	.03	.03	.04	.07	.07	0	0	0	.01	.37	.03	.06
27	.03	.03	.04	.07	.06	0	1.3	0	.01	.02	.06	.04
28	.03	.03	.04	.07	.03	.02	1.1	0	.01	.01	.03	.05
29	.03	.03	.04	.07	1.3	1.5	.02	-----	.01	.02	.03	.03
30	.03	.03	.04	.07	.01	.75	0	-----	.01	.02	.03	.03
31	.03	.03	-----	.07	-----	.02	0	-----	0	-----	.03	-----
TOTAL	1.98	0.83	1.07	1.85	10.77	7.36	2.44	0.81	0.87	1.70	2.14	1.01
MEAN	.064	.027	.036	.060	.36	.24	.079	.029	.028	.057	.069	.034
MAX	.14	.03	.04	.07	5.1	2.5	1.3	.68	.23	.54	1.2	.06
MIN	.03	.02	.03	.05	.01	0	0	0	0	0	.02	.02
AC-FT	3.9	1.6	2.1	3.7	21	15	4.8	1.6	1.7	3.4	4.2	2.0

WTR YEAR 2002: TOTAL 32.83 MEAN .090 MAX 5.1 MIN 0 AC-FT 65

Peak Discharge = 146 cfs on November 24, 2001

Table 42

**ARROYO TRABUCO AT DEL OBISPO STREET**

USGS Station NO. 11047300

Operated by the United States Geological Survey

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	2.0	1.6	1.5	1.4	2.0	7.2	3.0	5.4	4.8	4.5	4.2	2.6
2	2.1	1.6	1.6	1.4	1.9	6.9	3.0	5.1	4.6	4.8	4.0	2.4
3	2.3	1.6	1.5	1.5	2.0	37	5.6	5.0	4.2	4.9	3.9	2.4
4	2.5	1.6	1.5	1.8	2.8	8.1	5.4	4.9	4.2	5.0	3.8	2.4
5	2.7	1.5	1.5	1.7	3.3	6.2	5.3	4.8	4.0	4.9	3.7	2.3
6	2.4	1.6	1.5	1.7	2.6	5.5	5.1	5.1	4.1	10	3.6	2.1
7	2.2	1.7	1.5	1.6	2.5	5.2	5.3	5.1	46	5.7	3.5	2.1
8	2.0	1.7	1.5	1.8	2.2	5.0	5.2	5.1	19	5.2	3.5	2.2
9	2.4	1.7	1.6	2.1	2.2	5.4	5.2	5.1	5.7	5.0	3.5	2.5
10	2.2	1.7	1.6	2.2	2.1	7.3	5.2	4.9	4.7	4.9	3.2	2.4
11	2.2	1.6	1.6	2.1	2.4	8.2	5.2	5.1	4.6	4.7	3.1	2.3
12	2.1	1.6	1.6	2.1	24	5.1	5.4	5.4	4.3	4.8	3.2	2.3
13	2.0	1.6	1.5	1.9	28	5.1	5.4	5.3	4.2	4.7	3.1	2.3
14	2.0	1.7	1.5	1.8	2.8	36	5.6	5.4	3.9	4.3	3.0	2.4
15	2.0	1.7	1.3	1.8	2.3	12	5.7	5.5	3.8	10	3.2	2.2
16	2.0	1.6	1.3	1.9	1.9	5.9	6.4	5.3	3.7	5.4	3.1	2.0
17	2.0	1.6	1.4	2.0	1.8	5.5	7.8	29	7.7	4.2	3.3	2.1
18	1.9	1.6	1.6	1.5	1.8	5.4	6.0	8.6	30	4.1	3.3	2.0
19	1.9	1.6	1.7	1.0	1.8	5.5	5.7	6.0	4.3	4.1	3.7	2.0
20	1.9	1.6	1.7	1.8	1.7	5.4	5.5	5.8	3.8	4.1	4.3	2.1
21	1.9	1.6	1.8	1.9	1.8	120	5.9	5.5	3.6	4.1	4.7	1.7
22	2.2	1.6	1.6	2.0	1.7	14	5.7	5.5	3.5	4.2	3.5	1.5
23	1.8	1.5	1.6	2.0	1.9	7.9	5.6	5.2	15	4.4	3.2	1.5
24	1.9	1.5	1.9	2.1	240	7.1	5.1	5.1	6.5	34	2.9	1.4
25	1.8	1.4	1.6	2.0	57	6.6	5.5	4.9	4.1	8.4	2.9	1.4
26	1.8	1.4	1.7	2.0	10	6.5	5.6	4.8	3.9	4.7	2.9	1.4
27	1.8	1.5	1.7	1.9	7.2	6.4	8.2	4.7	3.9	4.4	2.8	1.6
28	1.7	1.6	1.6	1.9	6.4	6.3	112	4.7	4.2	4.4	3.0	1.6
29	1.8	1.6	1.5	2.1	37	15	24	-----	4.2	4.4	2.7	1.6
30	1.8	1.6	1.4	2.1	13	28	6.7	-----	4.3	4.4	2.5	1.5
31	1.5	1.6	-----	2.1	-----	16	5.9	-----	4.4	-----	2.7	-----
TOTAL	62.8	49.4	46.9	57.2	468.1	421.7	297.2	172.3	229.2	182.7	104.0	60.3
MEAN	2.03	1.59	1.56	1.85	15.6	13.6	9.59	6.15	7.39	6.09	3.36	2.01
MAX	2.7	1.7	1.9	2.2	240	120	112	29	46	34	4.7	2.6
MIN	1.5	1.4	1.3	1.0	1.7	5.0	3.0	4.7	3.5	4.1	2.5	1.2
AC-FT	125	98	93	113	928	836	589	342	455	362	206	120

WTR YEAR 2002 TOTAL 2,151.8 MEAN 5.85 MAX 240 MIN 1.0 AC-FT 4,267

Table 43

**SANTA ANA RIVER BELOW PRADO DAM**

USGS Station NO.11074000  
Operated by the United States Geological Survey

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	192	188	194	205	235	190	207	326	250	289	286	224
2	193	188	194	198	236	190	225	322	236	303	256	222
3	196	181	194	207	223	217	269	321	234	306	243	219
4	189	194	199	210	237	307	291	282	256	293	242	222
5	219	190	193	208	242	330	286	307	255	280	243	222
6	226	187	193	209	241	313	281	315	239	273	244	220
7	214	185	181	211	237	337	279	312	237	270	243	218
8	208	186	183	214	238	332	277	308	253	270	240	216
9	200	186	195	211	234	333	276	297	251	269	238	215
10	196	185	199	216	232	331	271	291	251	266	239	214
11	196	188	196	216	234	343	268	308	250	261	237	214
12	192	188	196	211	239	349	268	312	227	261	233	213
13	192	189	198	203	291	344	267	308	233	261	232	213
14	194	190	194	209	261	324	289	306	232	266	233	211
15	194	182	193	214	262	269	307	302	227	270	236	210
16	195	184	196	208	258	268	304	298	230	267	233	209
17	195	188	201	212	249	309	301	296	230	229	231	215
18	197	189	195	218	243	328	298	296	266	286	230	216
19	201	187	199	217	260	321	295	287	300	272	231	213
20	193	186	198	218	262	276	294	263	314	258	235	216
21	193	173	201	224	248	257	291	260	317	255	237	210
22	190	184	201	231	242	331	291	259	313	259	233	205
23	184	193	202	232	242	329	266	257	312	260	233	207
24	189	191	202	241	264	322	254	254	311	272	234	211
25	187	190	195	238	276	321	255	267	309	269	234	207
26	184	188	188	237	335	318	255	270	308	257	234	206
27	188	187	189	227	365	316	255	277	305	265	231	208
28	184	185	186	231	289	258	217	271	303	266	232	201
29	184	188	189	238	189	206	241	-----	300	266	231	199
30	190	190	194	237	190	207	265	-----	295	285	227	201
31	193	190	-----	242	-----	207	302	-----	293	-----	225	-----
TOTAL	6048	5799	5838	6793	7554	9083	8445	8172	8337	8104	7356	6377
MEAN	195	187	195	219.1	251.8	293	272.4	291.9	268.9	270.1	237.3	212.6
MAX	226	194	202	242	365	349	307	326	317	306	286	224
MIN	184	173	181	198	189	190	207	254	227	229	225	199
AC-FT	12000	11500	11580	13470	14980	18020	16750	16210	16540	16070	14590	12650

WTR YEAR 2002 TOTAL 87906 MEAN 241.2 MAX 365 MIN 173 AC-FT 174360

Table 44

**SAN JUAN CREEK AT LA NOVIA STREET**

USGS Station NO.11046530  
Operated by the United States Geological Survey

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
WATER YEAR JUL 2001 TO JUN 2002

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	0	0	0	0	0	5.0	2.1	.33	.49	2.1	2.0	0
2	0	0	0	0	0	2.5	1.4	.15	.23	1.8	.63	0
3	0	0	0	0	0	2.3	1.2	.15	0	1.6	0	0
4	0	0	0	0	.01	1.9	1.1	.24	0	.93	0	0
5	.17	0	0	0	0	.95	.60	.24	0	.53	0	0
6	.31	0	0	0	0	.30	.79	0	0	2.2	0	0
7	0	0	0	0	0	.08	.91	0	.12	1.9	.12	0
8	0	0	0	0	0	0	.56	0	1.8	1.9	.40	0
9	0	0	0	0	0	.54	.35	0	1.3	1.4	1.1	0
10	0	0	0	0	0	.26	.34	0	.61	1.2	0	0
11	0	0	0	0	0	0	.20	0	.32	1.9	0	0
12	0	0	0	0	2.8	0	.05	.08	0	.80	0	0
13	0	0	0	0	.05	0	.89	0	.11	.75	0	0
14	0	0	0	0	0	.75	1.8	0	.08	.51	0	0
15	0	0	0	0	0	.98	2.2	0	0	.85	0	0
16	0	0	0	0	0	.43	2.6	0	0	.33	0	0
17	0	0	0	0	0	0	3.0	3.9	1.9	1.0	0	0
18	0	0	0	0	0	.31	3.2	2.6	4.1	.51	0	0
19	0	0	0	0	0	.52	2.4	2.3	4.4	.06	0	0
20	0	0	0	0	0	.06	2.6	2.0	2.4	.15	0	0
21	0	0	0	0	9.2	2.8	1.6	1.8	.35	0	0	0
22	0	0	0	0	0	7.9	2.1	1.6	1.1	.26	0	0
23	0	0	0	0	0	2.9	1.6	1.6	6.7	.02	0	0
24	0	0	0	0	88	1.7	.67	1.2	5.9	1.5	0	0
25	0	0	0	0	99	1.3	1.5	.74	4.7	1.1	0	0
26	0	0	0	0	25	1.2	2.0	1.0	3.5	1.4	0	0
27	0	0	0	0	8.6	1.1	2.3	.89	2.1	2.4	0	0
28	0	0	0	0	5.2	.85	6.8	.84	2.2	2.8	0	0
29	0	0	0	0	13	.78	3.8	-----	2.0	2.6	0	0
30	0	0	0	0	7	1.6	1.9	-----	2.3	2.3	0	0
31	0	0	-----	0	-----	2.6	.74	-----	2.3	-----	0	0
TOTAL	0.48	0	0	0	248.66	48.01	54.50	21.46	52.46	37.15	4.25	0
MEAN	.015	0	0	0	8.29	1.55	1.76	.77	1.69	1.24	.14	0
MAX	.31	0	0	0	99	9.2	6.8	3.9	6.7	2.8	2.0	0
MIN	0	0	0	0	0	0	.05	0	0	.02	0	0
AC-FT	1.0	0	0	0	493	95	108	43	104	74	8.4	0

WTR YEAR 2002 TOTAL 305.10 MEAN .83 MAX 37 MIN 0 AC-FT 605

Table 45

**SANTA ANA RIVER AT 5TH STREET**

USGS NO.11070800

Operated by the United States Geological Survey

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	22	.06	0	0	.09	0	0
4	0	0	0	0	0	1.7	0	0	0	0	0	0
5	.64	0	0	0	0	0	0	0	0	.12	0	0
6	0	0	0	0	0	0	0	0	.39	.89	0	0
7	0	0	0	0	0	.05	0	0	9.5	0	0	0
8	0	0	0	0	0	0	0	0	2.3	.10	0	0
9	0	0	0	0	0	0	0	0	.02	0	0	0
10	0	.45	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	.02	0	0	0	0
12	0	0	0	0	4.5	0	0	0	0	0	0	0
13	0	0	0	0	63	0	0	0	0	0	0	0
14	0	0	2.5	0	26	15	0	0	2.6	0	0	0
15	0	0	.14	0	2.0	14	0	0	2.9	.48	0	0
16	0	.05	.38	0	.08	.40	0	0	.28	1.5	0	0
17	0	0	1.1	0	0	0	0	2.0	.93	3.2	0	0
18	0	0	.39	0	0	0	0	1.7	17	2.7	0	0
19	0	0	.19	0	0	0	0	.04	5.4	.20	0	0
20	0	0	0	0	.11	0	0	0	1.7	.28	.17	0
21	0	.29	0	0	.26	41	0	0	.12	.06	0	0
22	0	0	0	0	0	.80	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	2.9	0	0	0
24	0	0	0	0	674	.39	0	0	4.7	.54	0	0
25	0	0	0	0	53	12	0	0	1.4	.04	0	0
26	0	0	0	0	.83	9.9	0	0	.33	.13	0	0
27	0	0	0	0	0	1.4	3.9	0	0	0	0	0
28	0	0	0	0	0	0	289	0	0	0	0	0
29	0	0	0	0	56	15	5.9	-----	0	0	0	0
30	0	0	0	0	6.5	10	.41	-----	0	0	0	0
31	0	0	-----	0	-----	2.7	0	-----	0	-----	0	-----
TOTAL	0.64	0.79	4.70	0	886.28	146.33	299.27	3.76	52.47	10.33	0.17	0
MEAN	.021	.025	.16	0	29.5	4.72	9.65	.13	1.69	.34	.005	0
MAX	.64	.45	2.5	0	674	41	289	2.0	17	3.2	.17	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	1.3	1.6	9.3	0	1,760	290	594	7.5	104	20	.3	0

WTR YEAR 2002 TOTAL 1,404.74 MEAN 3.85 MAX 674 MIN 0 AC-FT 2,788

Table 46

**SANTIAGO CREEK AT BRISTOL**

USGS NO.11077500

Operated by the United States Geological Survey

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	3.3	0
4	0	0	0	0	0	0	0	0	0	.17	4.8	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	4.2	0	0	0	0	0	0	0
8	0	0	.76	0	0	0	0	0	0	0	0	0
9	0	0	1.2	0	0	0	0	0	0	0	0	0
10	0	0	2.4	0	0	0	0	0	0	0	0	0
11	0	0	.90	0	0	0	0	0	0	0	0	0
12	0	0	.79	0	6.6	0	0	0	0	0	0	0
13	0	0	0	0	2.0	0	0	0	0	0	0	0
14	0	0	.75	0	0	0	0	0	0	0	0	0
15	0	0	.32	0	0	0	0	0	0	.33	0	0
16	0	1.8	0	0	0	0	0	0	0	7.2	0	0
17	0	.13	0	0	0	0	0	0	0	8.7	0	0
18	0	0	0	0	0	0	0	0	0	5.0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	.03	0	0	0	8.9	0	0	0	0	0	0
22	0	.16	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	14	0	0	0	0	0	0	0
25	0	0	0	0	.28	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	3.2	0	0	0	0	0
28	0	0	0	0	0	0	15	0	0	0	0	0
29	0	0	0	0	0	.48	0	-----	0	0	0	0
30	0	0	0	0	0	2.5	0	-----	0	0	0	0
31	0	0	-----	0	-----	.92	0	-----	0	-----	0	0
TOTAL	0	3.19	6.05	0	27.08	12.80	18.2	0	0	21.40	8.1	0
MEAN	0	.10	.20	0	.90	.41	.59	0	0	.71	.26	0
MAX	0	1.8	2.4	0	14	8.9	15	0	0	8.7	4.8	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	6.3	12	0	54	25	36	0	0	42	16	0

WTR YEAR 2002 TOTAL 96.82 MEAN .26 MAX 15 MIN 0 AC-FT 191.3

Table 47

**SANTIAGO CREEK AT MODJESKA CYN.**

USGS Station NO. 11075800  
 Operated by the United States Geological Survey

DAILY DISCHARGE IN CUBIC FEET PER SECOND  
 WATER YEAR JUL 2001 TO JUN 2002

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	.04	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	-----	0	0	0	0
30	0	0	0	0	0	0	0	-----	0	0	0	0
31	0	0	-----	0	-----	0	0	-----	0	-----	0	0
TOTAL	0	0	0	0	0.04	0	0	0	0	0	0	0
MEAN	0	0	0	0	.001	0	0	0	0	0	0	0
MAX	0	0	0	0	.04	0	0	0	0	0	0	0
MIN	0	0	0	0	0	0	0	0	0	0	0	0
AC-FT	0	0	0	0	.08	0	0	0	0	0	0	0

WTR YEAR 2002: TOTAL 0.04 MEAN 0 MAX .04 MIN 0 AC-FT .1

Table 48

**SAND CANYON AT CULVER DRIVE**

Newport Bay Sediment TMDL Station  
 Operated by United States Geological Survey  
 USGS NO.11048553

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.11	.20	.12	.08	.24	.20	.25	.30	.30	.23	.10	.13
2	.11	.18	.10	.06	.22	.17	.22	.26	.30	.23	.11	.11
3	.11	.15	.13	.08	.29	.53	.21	.18	.29	.24	.10	.13
4	.13	.16	.16	.09	.89	.25	.17	.18	.31	.20	.11	.10
5	.14	.19	.10	.12	.53	.20	.16	.17	.32	.18	.10	.11
6	.16	.18	.08	.10	.29	.19	.14	.18	.35	.32	.13	.13
7	.19	.16	.09	.10	.17	.20	.14	.18	1.5	.20	.12	.08
8	.27	.15	.14	.11	.12	.19	.16	.20	.57	.18	.15	.08
9	.19	.15	.22	.11	.19	.24	.16	.19	.48	.11	.21	.08
10	.13	.15	.24	.11	.22	.36	.19	.16	.44	.12	.20	.10
11	.16	.18	.19	.09	.39	.27	.17	.16	.44	.12	.15	.09
12	.18	.17	.18	.08	1.2	.25	.17	.15	.45	.17	.12	.09
13	.16	.16	.16	.09	.85	.22	.17	.19	.45	.16	.15	.09
14	.14	.16	.16	.09	.36	.84	.17	.16	.42	.16	.13	.11
15	.12	.14	.18	.09	.25	.36	.21	.18	.42	.20	.15	.11
16	.13	.15	.18	.08	.16	.21	.23	.17	.41	.12	.19	.11
17	.10	.15	.18	.09	.14	.17	.14	2.3	.75	.09	.21	.12
18	.13	.14	.26	.09	.16	.18	.14	.35	.91	.10	.19	.11
19	.14	.14	.29	.09	.27	.19	.14	.27	.39	.13	.17	.15
20	.15	.12	.22	.09	.23	.24	.13	.23	.32	.14	.20	.14
21	.14	.12	.24	.06	.19	3.0	.14	.22	.35	.08	.21	.15
22	.14	.13	.07	.07	.11	.37	.16	.23	.35	.07	.16	.17
23	.13	.15	.06	.06	.10	.27	.13	.27	.56	.06	.15	.16
24	.12	.21	.08	.06	1.1	.22	.12	.27	.46	.18	.17	.14
25	.13	.27	.08	.14	.57	.18	.16	.29	.35	.15	.12	.14
26	.14	.12	.06	.33	.31	.16	.19	.33	.45	.12	.17	
27	.14	.12	.06	.23	.17	.16	.39	.82	.33	.18	.12	.15
28	.12	.11	.08	.18	.09	.16	3.3	.37	.29	.12	.14	.16
29	.12	.13	.06	.20	1.1	1.1	.44	-----	.28	.10	.14	.15
30	.15	.15	.06	.28	.36	1.3	.35	-----	.32	.09	.13	.15
31	.15	.15	-----	.28	-----	.52	.31	-----	.25	-----	.16	-----
TOTAL	4.43	4.84	4.23	3.73	11.27	12.90	9.16	8.96	13.69	4.88	4.61	3.71
MEAN	.14	.16	.14	.12	.38	.42	.30	.32	.44	.16	.15	.12
MAX	.27	.27	.29	.33	1.2	3.0	3.3	2.3	1.5	.45	.21	.17
MIN	.10	.11	.06	.06	.09	.16	.12	.15	.25	.06	.10	.08
AC-FT	8.8	9.6	8.4	7.4	22	26	18	18	27	9.7	9.1	7.4

WTR YEAR 2002 TOTAL 86.41 MEAN .24 MAX 3.3 MIN .06 AC-FT 171

Table 49

**BONITA CANYON CREEK AT MACARTHUR BLVD.**

Newport Bay Sediment TMDL Station  
 Operated by United States Geological Survey  
 USGS Station NO.11048600

**DAILY DISCHARGE IN CUBIC FEET PER SECOND**  
**WATER YEAR JUL 2001 TO JUN 2002**

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1	.51	.24	.50	.26	.58	1.0	.69	.34	4.2	.89	.49	.33
2	.48	.26	.44	.36	.35	1.3	.67	.35	4.3	.67	.44	.33
3	.41	.29	.33	.39	.57	2.2	.76	.33	4.1	.54	.44	.33
4	.36	.35	.27	.41	.90	1.7	.75	.33	4.4	.48	.41	.33
5	.35	.35	.31	.46	.56	1.3	.63	.36	4.5	.34	.47	.33
6	.35	.33	.29	.40	.67	1.3	.54	.37	4.7	.39	.48	.33
7	.38	.31	.31	.41	.60	1.2	.58	.41	5.7	.33	.41	.33
8	.33	.29	.27	.38	.53	1.0	.52	.38	3.7	.38	.45	.33
9	.35	.33	.25	.40	.57	1.0	.41	.35	3.1	.46	.48	.33
10	.42	.33	.36	.58	.50	.97	.50	.32	3.6	.59	.34	.33
11	.40E	.33	.43	.44	.85	.77	.43	.52	3.6	.63	.36	.33
12	.40E	.30	.53	.40	2.3	.75	.48	.86	3.8	.50	.33	.33
13	.40E	.15	.40	.40	1.8	.71	.50	1.2	3.9	.55	.33	.33
14	.40E	.18	.39	.48	.49	1.2	.55	1.6	3.5	.54	.33	.33
15	.40E	.72	.38	.69	.46	.66	.52	1.9	3.4	.61	.33	.33
16	.35E	.42	.32	.67	.45	.38	.50	1.9	3.3	.51	.33	.33
17	.35E	.38	.46	.41	.50	.39	.50	3.1	3.2	.50	.33	.33
18	.35E	.34	.35	.36	.50	.35	.44	2.1	2.8	.50	.33	.33
19	.35E	.36	.47	.47	.69	.38	.50	1.9	1.9	.51	.40	.41
20	.35E	.36	.44	.56	.59	.43	.47	2.0	1.9	.50	.37	.37
21	.35E	.36	.43	.43	.52	1.9	.39	2.3	1.9	.51	.29	.37
22	.35E	.33	.46	.36	.55	.64	.46	2.4	2.0	.50	.27	.48
23	.30E	.32	.40	.41	.53	.50	.36	2.7	2.3	.50	.26	.40
24	.30E	.33	.43	.51	3.1	.50	.38	3.1	1.9	.51	.26	.45
25	.30E	.33	.31	.38	1.3	.50	.40	3.5	1.9	.34	.28	.47
26	.30E	.39	.36	.38	.68	.55	.42	3.7	1.8	.46	.30	.53
27	.30E	.39	.33	.46	.63	.57	.62	3.8	1.6	.37	.33	.57
28	.28	.84	.39	.38	.50	.65	1.6	4.1	1.4	.40	.33	.59
29	.37	.60	.40	.49	2.2	1.1	.99	-----	1.2	.46	.33	.73
30	.23	.62	.34	.59	1.2	1.3	.47	-----	1.1	.48	.33	.77
31	.20	.53	-----	.70	-----	1.0	.39	-----	1.0	-----	.33	-----
TOTAL	10.97	11.66	11.35	14.02	25.69	28.20	17.44	46.22	91.70	14.95	11.16	12.08
MEAN	.35	.38	.38	.45	.86	.91	.56	1.65	2.96	.50	.36	.40
MAX	.51	.84	.53	.70	3.1	2.2	1.6	4.1	5.7	.89	.49	.77
MIN	.20	.15	.25	.26	.35	.35	.36	.32	1.0	.33	.26	.33
AC-FT	22	23	23	28	51	56	35	92	182	30	22	24

WTR YEAR 2002 TOTAL 295.44 MEAN .81 MAX 4.7 MIN .15 AC-FT 588